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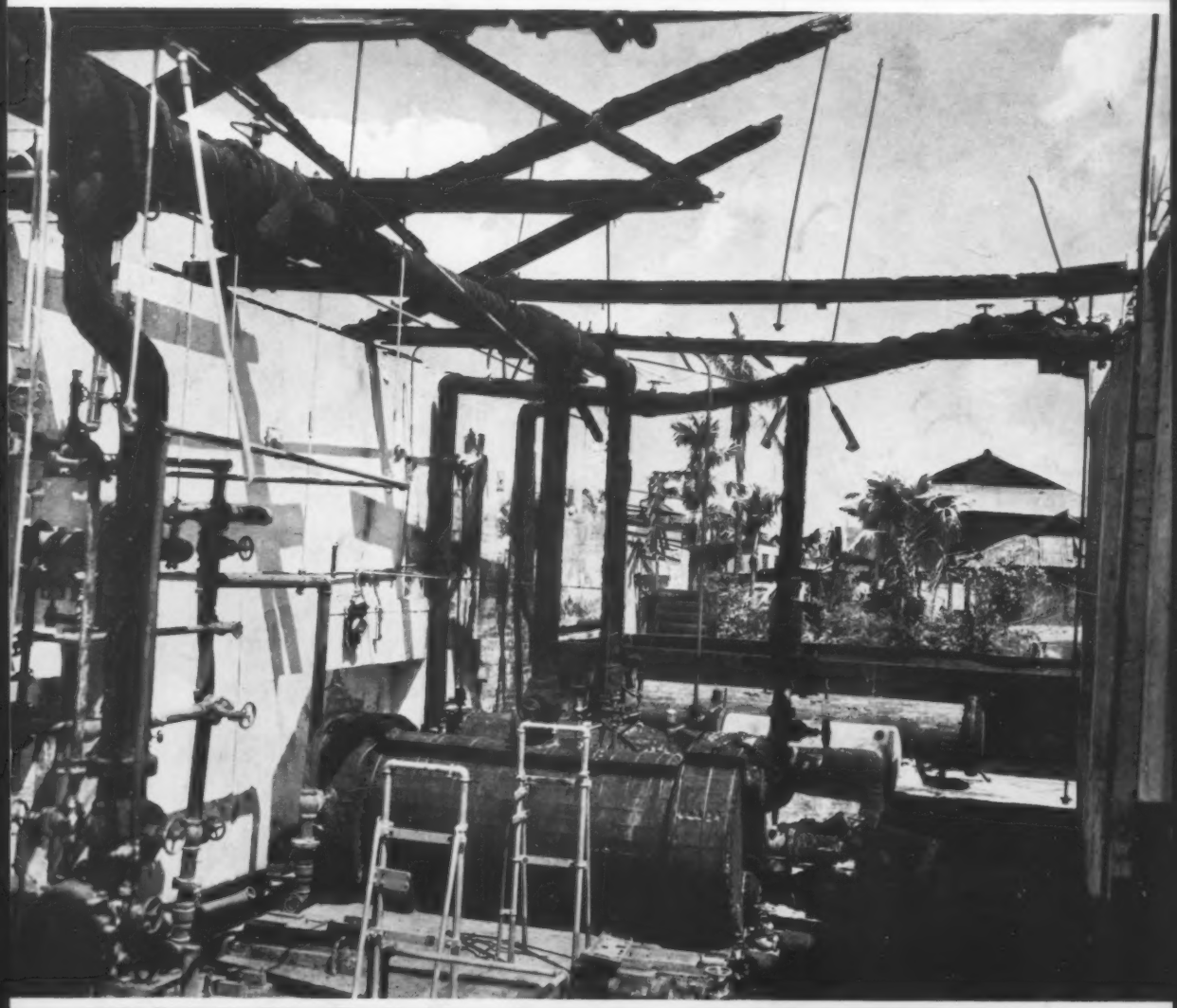
THE Refrigeration Industry

INSTALLATION
MAINTENANCE
MERCHANDISING

AIR CONDITIONING
MACHINERY

JUNE, 1945

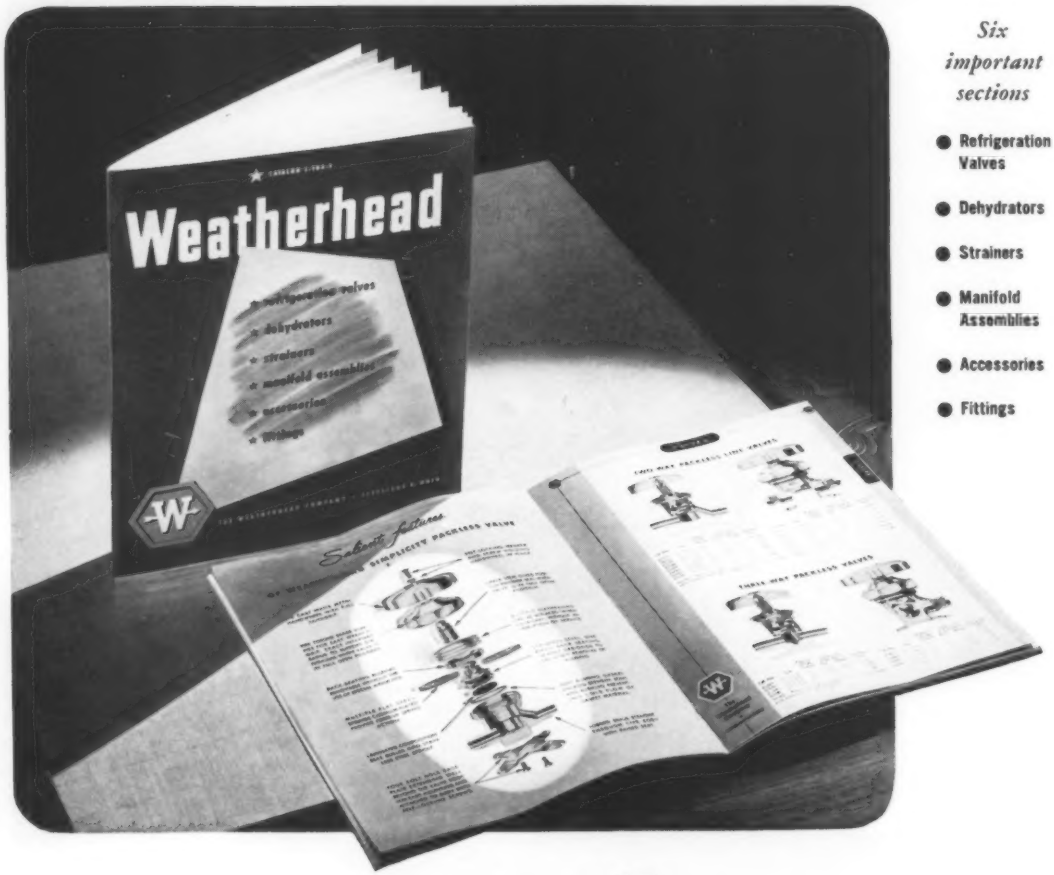


IN THIS ISSUE:

- Sales Opportunities in the Greenhouse-Nursery Field
- Priorities Guide-Post . . . How to Fit Piston Pins
- Coldspot Rebuilding (II) . . . Service Door to Sales

Every refrigeration man needs this new catalog!

Designers, engineers, service-men, purchasing agents—every key department head in the refrigeration field—should have this new Weatherhead Refrigeration Catalog. It gives you at a glance detailed, illustrated data on the multitude of *improved* refrigeration parts Weatherhead engineers have designed and created for original installations and replacement work. Write or call one of our branch offices for a free copy of this 40-page catalog.



Six important sections

- Refrigeration Valves
- Dehydrators
- Strainers
- Manifold Assemblies
- Accessories
- Fittings

Look Ahead with

Weatherhead

THE WEATHERHEAD COMPANY, CLEVELAND 8, OHIO
Plants: Cleveland, Columbia City, Ind., Warsaw, Ind., Los Angeles
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PAR BY LYNCH

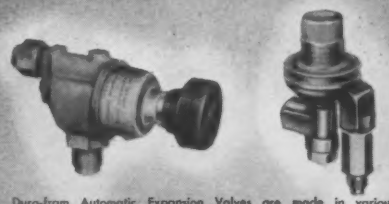
PAR Condensing Units are designed and manufactured on the same principles as fine automobile motors, with such outstanding features as drop forged steel crankshafts, hardened and lapped to mirror like surface. . . . Oilite crankshaft bearings with a high degree of porosity to insure constant lubrication. . . . Ring type pistons, two compression and one oil ring, hand fitted to each piston. These and many other features as oversized air-cooled condensers and large capacity receivers assure you of economical, efficient refrigeration and extra years of trouble-free service.

Par Units are available in models and sizes from 1/6 H.P. to 2 H.P. air-cooled units. See your Par Jobber or write today for complete specifications and illustrated catalogue R-96 and supplement R-96A on the Par line of air-cooled and water-cooled condensing units.

. . . . By Comparison — You'll Buy PAR

PAR Lynch DIVISION

Manufacturing Corporation, Defiance, Ohio U. S. A.



Dura-fram Automatic Expansion Valves are made in various capacities for domestic or other small boxes. Dura-fram diaphragms and Delubalay needles and seats assure long trouble-free operation.

"DETROIT" VALVES *For Every* REFRIGERATION NEED

There is a "Detroit" Expansion Valve of superior quality for every refrigeration need. Made better, they do the job better. Refrigeration men everywhere prefer "Detroit" Expansion Valves and "Detroit" Solenoid Valves.

Drying A REFRIGERATION SYSTEM

No. 2 of a Series

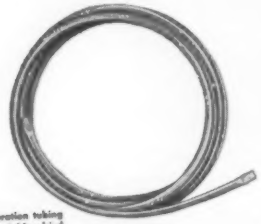
Moisture is refrigeration system enemy No. 1 Just a few drops can freeze up the expansion valve and put the system out of operation. Sometimes a system will operate satisfactorily for weeks or months, and then have moisture trouble because moisture in the system finally worked out of other parts and into the expansion valve.

Hence, thorough drying of a refrigeration system is of first importance, and the service man can't take too many precautions to be sure that all moisture is eliminated.

An important factor in keeping a refrigeration system free of moisture is the manner in which equipment is handled when taking it to the job.

If the parts are not capped or sealed tightly they are likely to contain moisture when they are installed. Refrigeration parts often are carried in a cold service car or kept in a cool place, such as a basement. When a cold part is taken into a warm room for installation, and is not sealed, moisture will condense on and in that part because its temperature is lower than the dew point of the air.

Therefore, it is important that all parts be kept closed until they have warmed up to the temperature of the room in which they are to be installed.



Refrigeration tubing is invariably dried thoroughly, and the ends sealed before shipping. If unsealed while cold, moisture will condense inside. Warm it up before opening.

No part, whether it is new or one which has been dried and sealed, should ever be opened until it has had time to become thoroughly warm. After it has been opened it should be installed immediately.

There are several methods of drying a system. The first of these to be described is:

Method No. 1—Heat and Vacuum

"Package" type systems, which are shipped completely assembled and ready to operate, are generally dried by this method.

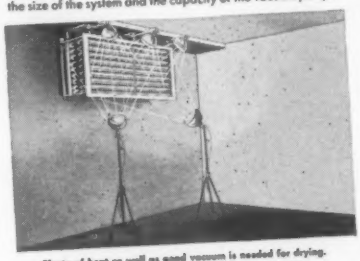
The complete unit is placed in a heated oven and connected to an efficient vacuum pump. The heat vaporizes the moisture from the inner walls of the tubing, compressor, valves, etc., and the vacuum pump draws this water vapor out of the system.

Neither heat nor vacuum alone is sufficient. The oven temperature will be governed by the construction of the unit to be dried; and the greater the vacuum, the more completely dehydrated the system will be.

Whenever possible, a "package" system which shows evidence of moisture should be removed from the job and dried in the above manner. However, if conditions do not permit removal of the unit for baking, or if the system is one which has been assembled in the field, satisfactory drying may be accomplished by heat and vacuum if the proper equipment is available.

The equipment necessary for drying a system on the job, by the heat and vacuum method, consists of infra-red or heat lamps, and a portable vacuum pump capable of drawing a vacuum of 28 or 29 inches of mercury. The following procedure is recommended:

Connect the vacuum pump to the system and start it running. With the heat lamps, warm every part of the system simultaneously, including all the tubing, and keep them warm, with the pump operating continuously. The length of time necessary to completely dehydrate will depend upon the size of the system and the capacity of the vacuum pump.



Plenty of heat as well as good vacuum is needed for drying. Use plenty of lamps so the whole system gets warm.

If all the tubing is not accessible for heating with the lamps or a torch, it should be removed from the system and either replaced with new dry tubing or thoroughly dried out and put back. New tubing will be more satisfactory in most cases.

In the case of a broken water-cooled condenser, where a large quantity of water has entered the system, all parts, including the tubing, should be removed and thoroughly dried in an oven. Here again, new tubing may be more practical.

Whenever any parts are removed from the system for drying in an oven, they should be capped or sealed as soon as they have cooled. If these parts are cold when they arrive at the job, they should be allowed to warm up to the temperature of the room in which they are to be installed before uncapping them.

This is No. 2 of a series of refrigeration service helps. In following issues we will deal with other methods of combating moisture trouble.

DETROIT LUBRICATOR COMPANY Division of AMERICAN RADIATOR & Standard Sanitary CORPORATION

Reprints of these articles, punched to fit your service book, available on request. Write for your copy.

No. 899 New Dura-fram Thermostatic Expansion Valves for commercial installations. Furnished with external or internal equalizer and forged union connection.

No. 673 Thermostatic Expansion Valve. For many years the standard of the refrigeration industry.

No. 793 Differential Temperature Expansion Valve specially designed for temperatures below minus 30° F.

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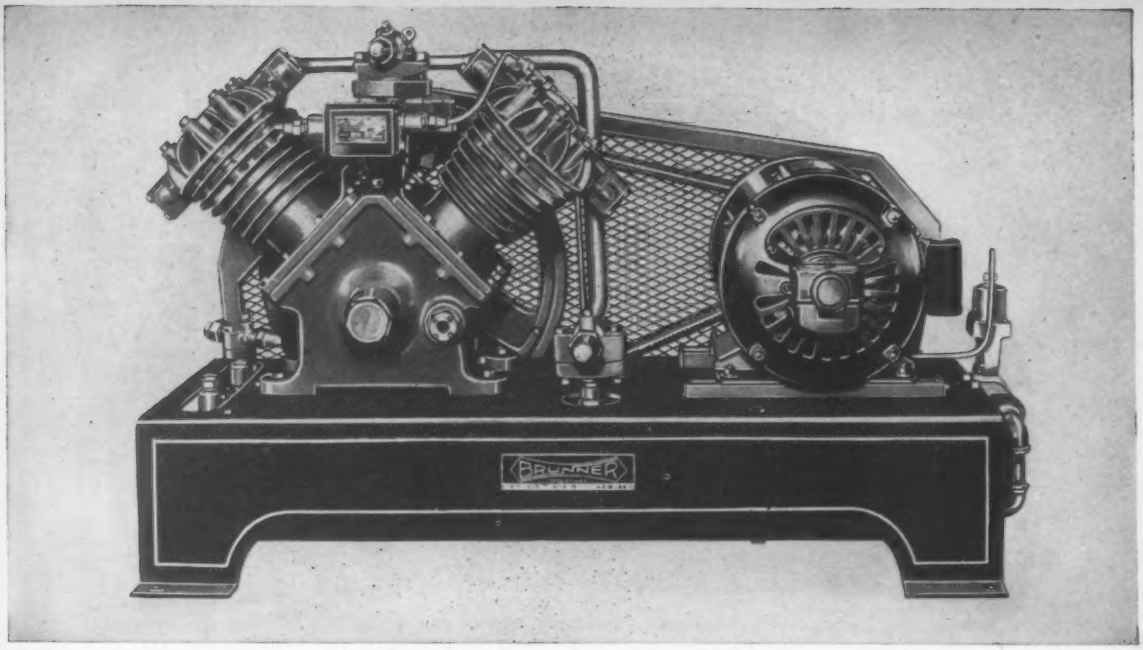
"DL" Heating and Refrigeration Controls • Engine Safety Controls • Safety Float Valves and Oil Burner Accessories • "Detroit" Expansion Valves and Refrigeration Accessories • Stationary and Locomotive Lubricators



YOUR SERVICE
must keep them serving!

It may be a long time before there will be enough new BRUNNER Condensing Units for all who want them. Therefore your service must keep them serving as long as possible. In this job, it is Brunner's desire to be of utmost assistance.

When you order Brunner replacement parts through your jobber, please make sure you include in your order all the information necessary to enable the jobber to ship the proper part. Always include the serial and model number of the unit as well as the part number. Most Brunner jobbers carry a complete stock of replacement parts. If they should be temporarily out of a desired part that is urgently needed, then it may be ordered direct from the factory. But, for quick service, we suggest you order through your jobber first.

Remember that it is our desire to help you keep all Brunner Condensing Units *operating* and we are prepared to assist in any way possible.

ARMY E NAVY
BRUNNER
For over 37 years the Symbol of Quality

BRUNNER MANUFACTURING COMPANY
UTICA 1, NEW YORK, U. S. A.

Watch a Gal do up her Hair-Springs

ONE OF THE REASONS 6 OUT OF 10 PICK U. S. GAUGES

A FUSSY-PLUS JOB IN GAUGE MAKING

Such is the importance and care required in making hair springs for gauges that U. S. Gauge entrusts the work only to its own operators. The fine, barely visible wire, is rolled flat to micrometric tolerances, coiled, and tempered.

These steps, completed in our own plant, are—to our knowledge—exclusive with U. S. Gauge.

WHY 6 OUT OF 10 CHOOSE U. S. GAUGE

Sure, making our own hair springs is important. But it is only one of many similar steps in U. S. Gauge-making you can reduce to two words—*Manufacturing Control.* U. S. Gauge Manufacturing Control is the eye-everywhere that watches raw materials, manufacturing, assembling, calibration, testing and inspection. It's all reasons rolled into one why experienced buyers choose U. S. Gauge more than 6 out of 10 times.

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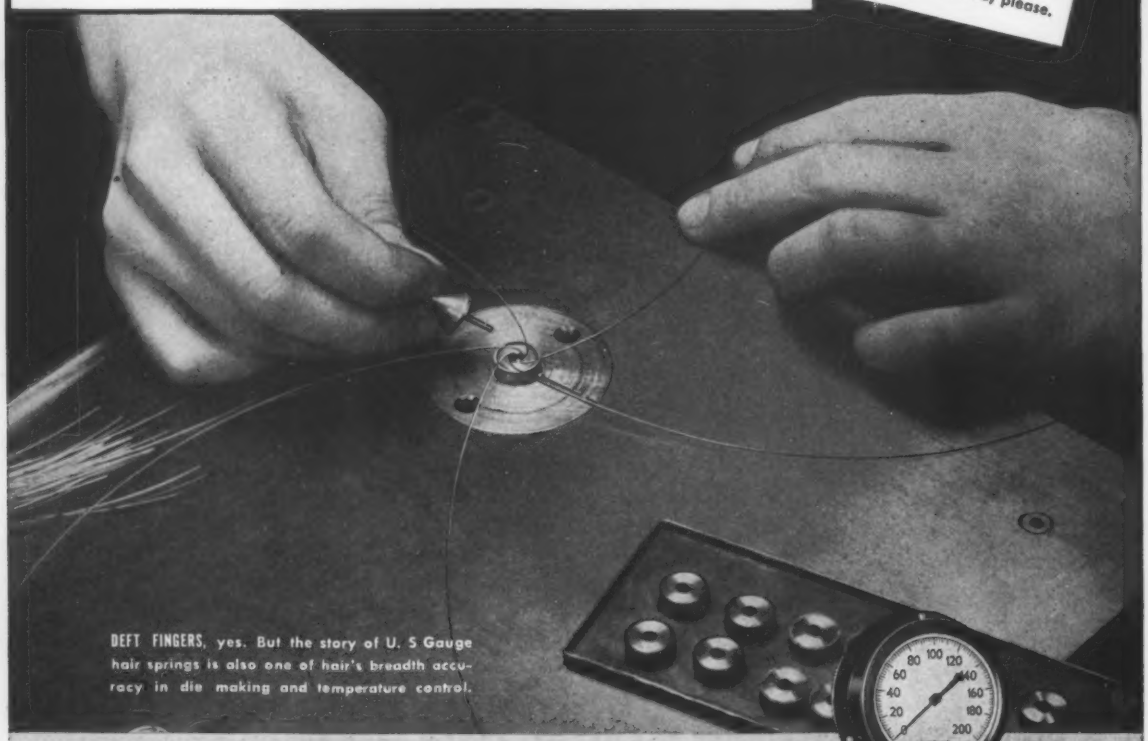
Whatever your product or industry, you should have at your elbow the new 102 Page U. S. Gauge catalog. An encyclopedia of gauges, gauge movements, and gauge manufacture. Streamlined to save you time in finding and reading. Special pull-out guide makes ordering easy. Reserve your copy (no obligation) on your business letterhead, please.



DEFT FINGERS, yes. But the story of U. S Gauge hair springs is also one of hair's breadth accuracy in die making and temperature control.

UNITED STATES GAUGE CO.

SELLERSVILLE, PA.

Manufacturers of Pressure, Temperature, Flow, Electrical and Level Measuring Instruments

USG U.S. INSTRUMENTS Tell The Truth

THE Refrigeration INDUSTRY

VOLUME 2, No. 6 JUNE, 1945

The Refrigeration Industry

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Published Monthly by REFRIGERATION PUBLICATIONS, INC., Cleveland, Ohio.
IRVING B. HEXTER, Pres.
LESTER P. AURBACH, V.Pr.

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THE COVER . . . One of the reasons we're short of skilled civilian refrigeration manpower today is the talent it takes to make something out of plants like this ex-Jap cold storage warehouse in the Marianas, shown after Navy fighters have finished giving it a going-over. Using salvaged materials except for lumber and nails, Seabees made it over into an ice plant producing eight tons a day. (Official U. S. Navy Photo).

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Link this Good Name with Yours!

Copeland

DEPENDABLE *Electric* REFRIGERATION

This catalog gives you complete facts on the entire Copeland line. It should be in your files for ready reference.

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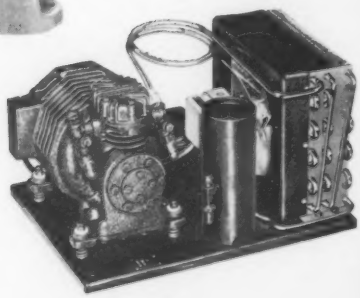

With Copeland units, you offer over a quarter century of exclusive refrigeration experience—*experience* that brings you the best in engineering features and manufacturing precision—*experience* that insures low cost, trouble-free, dependable operation.

There is a Copeland unit to meet the needs of any customer. You can't find a better source! Why not write us today?

COPELAMETIC

The Accessible Hermetic . . . combines all the good features of welded-in hermetics and open-type units. No belt—no seal—no manual oiling.

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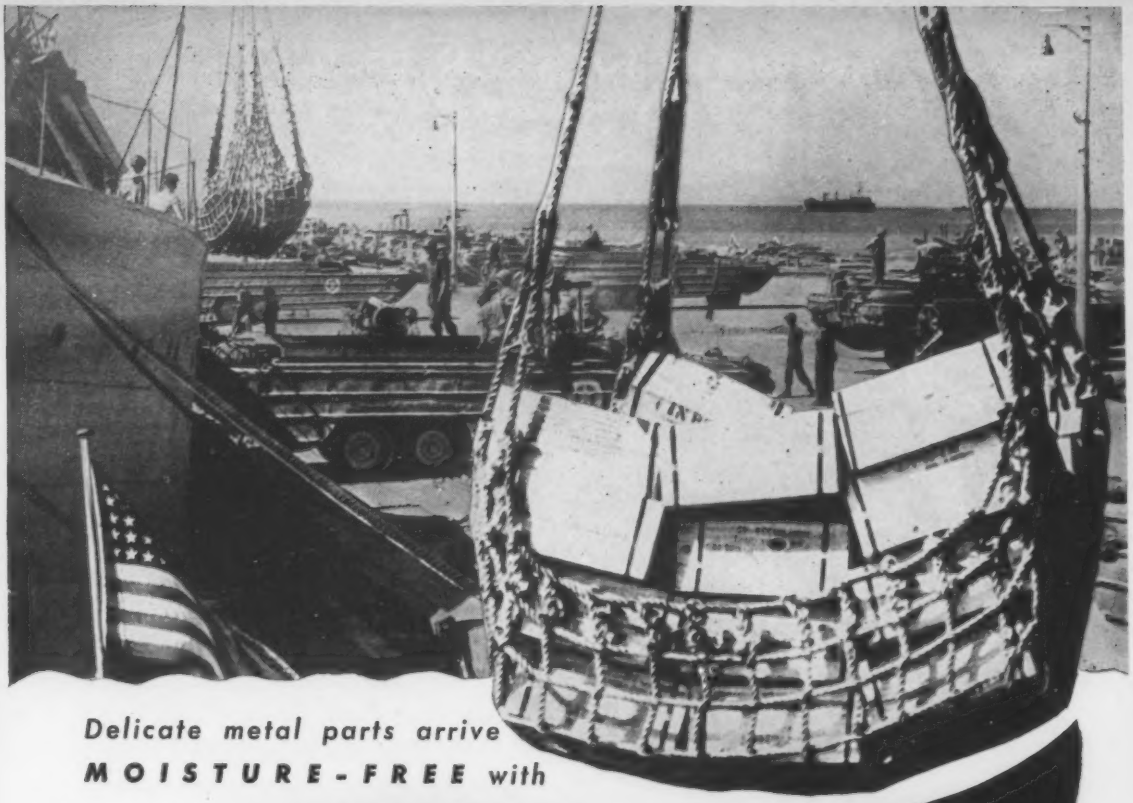


Delicate metal parts arrive
***MOISTURE-FREE** with*

Joliet SILICA-GEL

The ideal drying agent....

THOUSANDS OF PACKAGES of delicate, precision metal parts are being delivered to our fighting fronts . . . moisture-free and rust free . . . because of Joliet Silica Gel.

The power of crystalline Joliet Silica Gel to absorb atmospheric moisture within containers is almost phenomenal. Its drying action prevents rust and corrosion. Moreover, it is widely used as a drying agent in cartons and boxes of foods, fabrics, chemicals and other commodities.

Joliet Silica Gel is strictly a quality product. It is clear white; passes a rigid section test; meets exacting government specifications. Write today for full information.

Opportunity for Jobbers

There are excellent opportunities for jobbers to build profitable business on Joliet Silica Gel in a few territories. Write for details.

JOLIET CHEMICALS, LTD.
INDUSTRY AVENUE
JOLIET, ILLINOIS

Here is the New MUELLER BRASS CO. REFILLABLE DEHYDRATOR

Readily Removable Inlet For *Easy Refilling!*

When recharging our new Dehydrator, simply remove the inlet plug—back out the slotted inlet screen tube—shake out the exhausted agent, then replace with new.

In addition to this convenient feature (see illustration above) Mueller Brass Co. Filters and Driers are provided with the CONE SCREEN OUTLET, a specially designed filtering element that adds immeasurably to the life and efficiency of Driers and Filters.

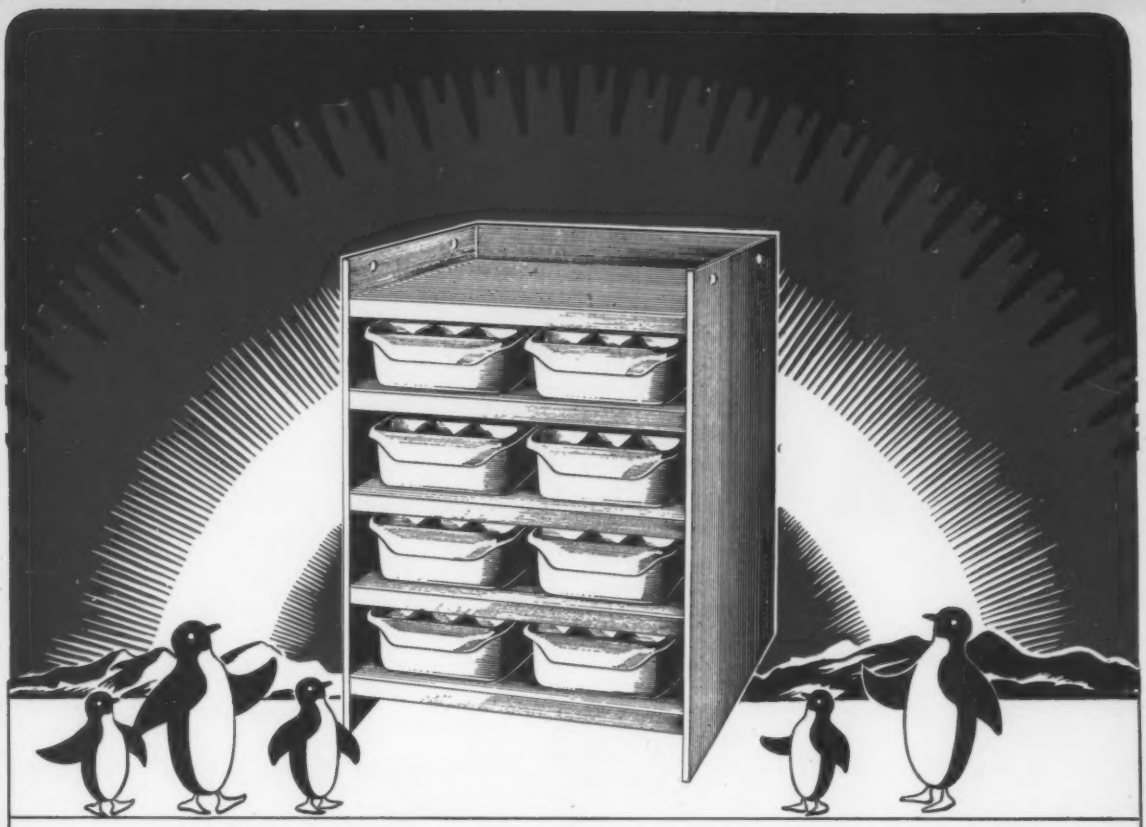
Almost all crystalline dehydrating agents are subject to a certain amount of abrasion while a dehydrator is in service. Small portions of the dehydrating agent break down into very fine powder and crystals. Unless a well-designed filtering element is incorporated in a dehydrator, these fine crystals and powder have a tendency to clog the outlet filter, resulting in restriction to the flow of refrigerant.

With the MBCO. CONE SCREEN OUTLET, such finer crystals and powder are forced to the base of the cone, leaving the center and tip of the screen open to the free flow of refrigerant.

In adddition, the cone screen is filled with pure wool which traps such particles that are sufficiently fine to pass through the screen mesh.

Particular attention has been paid to screen areas in Mueller Brass Co. Filters and Dehydrators, so that each size permits efficient passage to the maximum refrigerant volume that is used in a particular size refrigerant line.

MUELLER BRASS CO. PORT HURON, MICH.



Bush ICE MAKING COILS

All Bush Ice-Making Coils are constructed with steel casings and sufficient copper tubing in each shelf to insure rapid freezing of ice. Built to highest specifications, Bush Ice-Making Coils are part of the equipment of every Liberty ship which goes down the ways. Hundreds of these fine units have been installed in Army camps, hospitals, mess halls . . . and they have been used in many other war-essential as well as civilian applications.

Available in two types:—Standard Coil and Finned Coil Models—with tray capacities ranging from single-row three-tray models to double-row 24-tray models, capable of producing from 42 to 576 ice cubes at one freezing. No matter what your requirements, there is a Bush Ice-Making Coil to meet your needs efficiently and economically.

Write for new Bush Catalog which illustrates and describes the Bush Ice-Making coil . .. and other Bush Heat Transfer Products. For advanced engineering . . . Buy Bush.

Heat Transfer Products by **BUSH**

HARTFORD, CONNECTICUT 415 LEXINGTON AVENUE, NEW YORK ★ 549 W. WASHINGTON BOULEVARD, CHICAGO
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WHAT IS YOUR GASKET PROBLEM?

HIGH PRESSURE—LOW PRESSURE—HIGH TEMPERATURE—LOW TEMPERATURE LIQUIDS—VAPORS OR CHEMICALS . . . FITTING STYLE OR MAINTENANCE QUESTIONS

Nothing pleases us more than an opportunity to *prove* that Flexitallic Gaskets can handle sealing jobs better than they've ever been handled before — and far better than is possible with either conventional or so-called "special" gasket types. That has been our sole job for 33 years.

No other gasket can seal so perfectly because no other gasket incorporates the design features which make Flexitallic supreme for difficult applications. Spiral-wound construction automatically compensates for pressure surges, vibration, expansion, contraction. Bolt tension is controlled by gasket yield. Seal with Flexitallic — and it stays sealed.

FLEXITALLIC GASKET COMPANY
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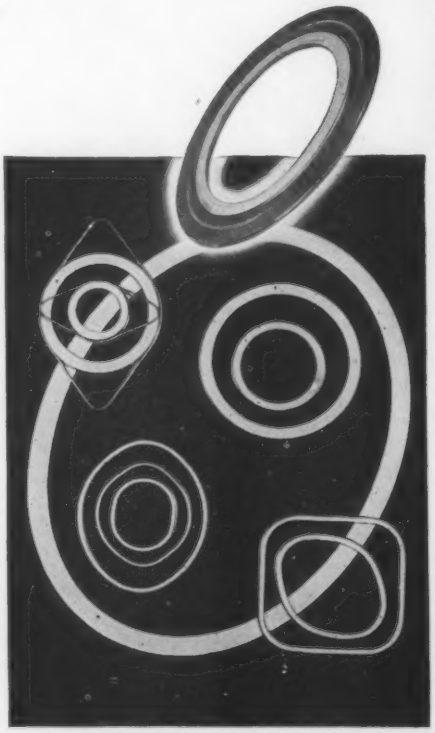
"Flexitallic"
REG. U. S. PAT. OFFICE



Flexitallic Gaskets are regularly supplied in styles for American standard flanges and pressure vessels of all types and for extreme pressure and temperature ranges. Our engineers welcome the opportunity to acquaint you with the possibilities of these unique gaskets for your applications.

THE ORIGINAL SPIRAL-WOUND GASKET . . . MADE ONLY BY FLEXITALLIC

Only Henry makes a Diaphragm Packless Valve that is NON-DIRECTIONAL

● Experience has taught the refrigeration industry that in a Henry Product it can always reasonably expect some extra value and a better feature of design and construction. The Henry Packless Valve is an outstanding example.

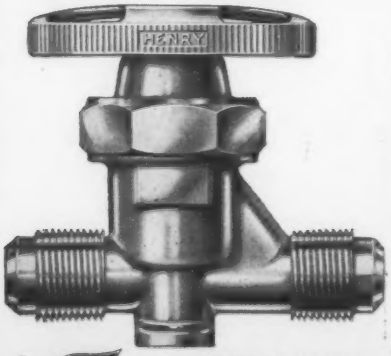
By means of a patented balancing channel in the lower valve stem, explained in detail below, the Henry Diaphragm Packless Valve cannot stick shut regardless of the pressure differential above or below the valve seat. When using a conventional valve, there is always the possibility that a valve installed in reversed position could fail to open if sufficiently high pressures should develop above the seat. The Henry Diaphragm Packless Valve, however, can be relied upon to give positive performance under all conditions of service because it is truly non-directional.

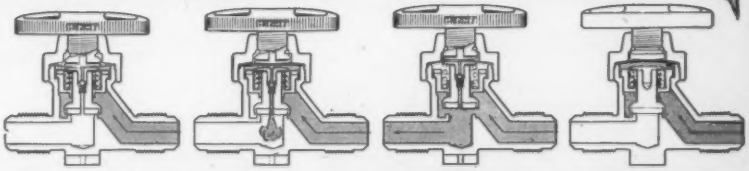
You will also like the Henry feature of having inlet and outlet ports in line on two way and three way valves. This eliminates tube bending and results in neater lines and lower installation costs.

During the war Henry Diaphragm Packless Valves have been widely favored by all branches of the armed services. It is only natural that, as our country gradually turns to the problems of Peace, this Henry Product again will be the logical choice of manufacturers, jobbers, contractors and service organizations everywhere.

The Difference Between a Henry *Non-Directional Balanced-Action Diaphragm Packless Valve and a Conventional Packless Valve*

Available in a complete range of sizes with flare or solder connections.





BALANCED-ACTION VALVE IN CLOSED POSITION—High pressure above the seat, low pressure below the seat. High pressure regions are shown in color. Pressure in spring cage below diaphragms is the same as that in main passage of valve body above the seat. This is due to seepage between the lower stem and the guide. Downward pressure of the bearing plate on the diaphragms seals the upper port of the balancing channel.

OPENING THE BALANCED-ACTION VALVE—As hand wheel is turned to open valve the diaphragms, because of pressure beneath them and their own snap action, rise and expose the upper port of the balancing channel. The high pressure, shown in color, unseats ball check and is instantly released through the open channel to the low pressure region below the valve seat, thus achieving "balanced-action" by equalizing pressures.

BALANCED-ACTION VALVE IN FULL OPEN POSITION—Equalization or balancing of pressures above and below the seat, as shown in color, guarantees that this valve can never "stick shut" but will always open positively, regardless of original differential in pressures. When there is high pressure below the seat and low pressure above, the balanced valve opens easier than other types because of the light weight spring.

CONVENTIONAL TYPE WITHOUT BALANCED-ACTION—As hand wheel is turned to open valve the diaphragms rise. When the differential between high pressure, shown in color, above seat and low pressure below seat is greater than force exerted by heavy spring, stem "sticks shut"—valve remaining closed. The heavy spring required in this type of valve greatly increases diaphragm wear and strain and causes stiff closing.

ARMY E NAVY

SOLD BY JOBBERS

HENRY VALVE COMPANY — HENRY VALVE CO.

3260 WEST GRAND AVENUE, CHICAGO 51, ILLINOIS

EXPORT DEPARTMENT, 13 E. 40TH ST., NEW YORK 16, N.Y. CABLE: ARLAB

PACKLESS AND PACKED VALVES • STRAINERS • DRYERS FOR REFRIGERATION AND AIR CONDITIONING
AMMONIA VALVES • FORGED STEEL VALVES AND FITTINGS FOR OIL, STEAM AND OTHER FLUIDS

Another Dependable CURTIS Refrigeration Installation at No. Dakota Locker Plant

Yes, here's another installation of Curtis Condensing Units at the locker plant of the Harvey Cooperative Creamery Association, Harvey, N. Dak. Curtis equipment at this modern plant was installed by the Refrigeration Equipment Company, Minot, N. Dak., Curtis dealer.

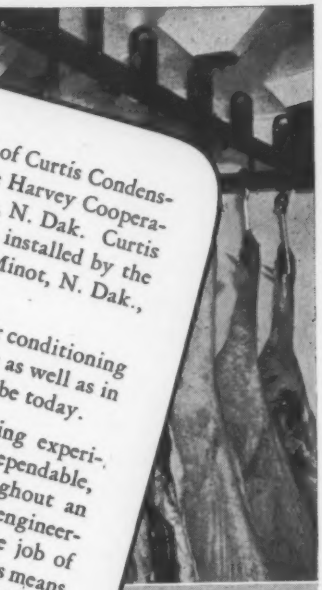
You'll find Curtis refrigeration and air conditioning units in all types of civilian installations as well as in vital Army and Navy uses around the globe today.

Ninety years of successful manufacturing experience back up every Curtis unit, assure dependable, economical trouble-free performance throughout an exceptionally long machine life. Advanced engineering, precision manufacture, plus our wartime job of continuous production of regular Curtis products means even finer Curtis units when peace has been achieved.

The complete Curtis line offers units and equipment for practically every air conditioning and refrigeration requirement. Condensing Units from ¼ to 30 H.P. air and water cooled; packaged air conditioning units, packaged and remote types, from 3 to 15 tons. Write to Curtis for full information.

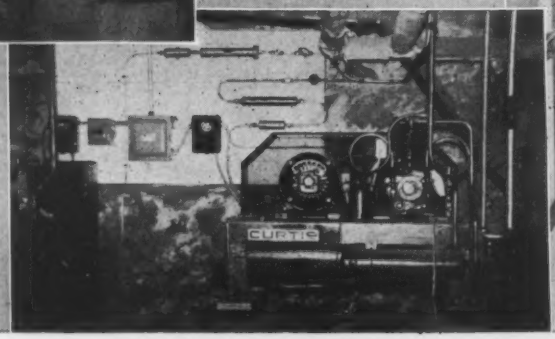
CURTIS REFRIGERATING MACHINE DIVISION
of Curtis Manufacturing Co.
1915 Kienlen Avenue St. Louis 20, Missouri

R-420

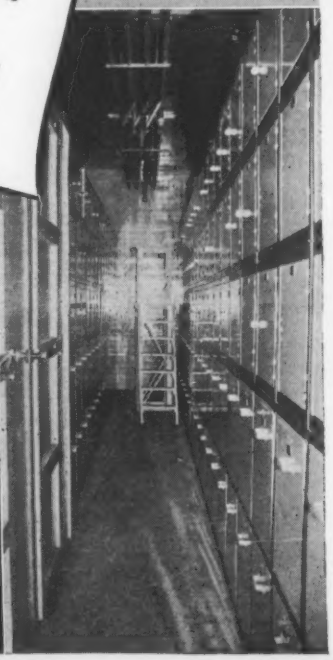


Interior views of New Locker Plant of the Harvey Cooperative Creamery Assn., Harvey, N. Dak.

1½ H. P. Curtis Air Cooled Condensing Unit

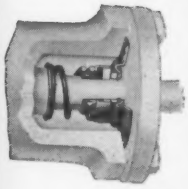


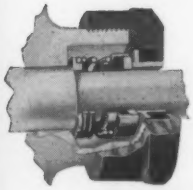
3 H.P. Curtis Shell and Tube Condensing Unit



EVERY BOND WE BUY...

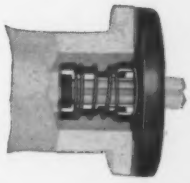
Speeds the Dawn of a Glorious Peace





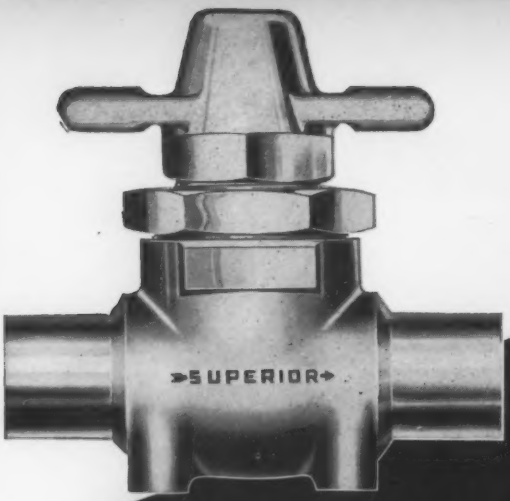
Let us back our fighting men in the Pacific with fighting dollars in War Bonds . . . it's *"two down and one to go"* for complete Victory.

ROTARY SEAL Replacement Units are another good investment—they are available for 752 models of refrigerating compressors. Buy ROTARY and you buy the best. In today's market and in the great post-war era that lies ahead you can make no finer choice than these famous seals. The name is your assurance of complete satisfaction.



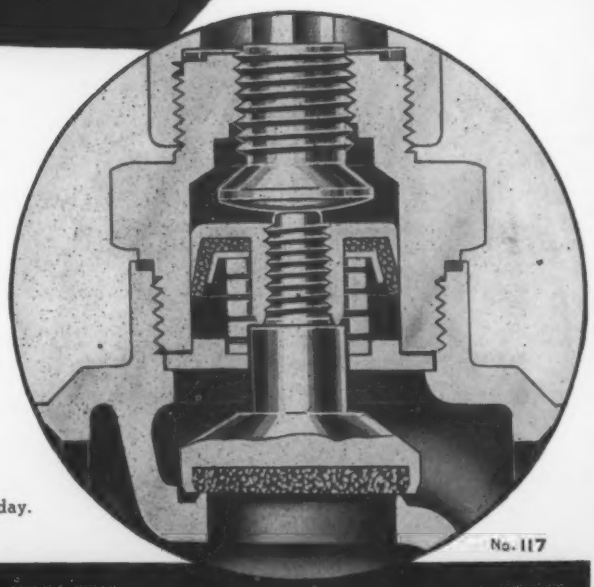
ROTARY SEAL COMPANY

2020 North Larrabee St. Chicago 14, Ill.



Superior PRESSURE CUP VALVES THE *Inside* STORY

The skirt of the pressure responsive cup—acting like the piston in an automobile tire pump—automatically forms a positive pressure seal, with the valve stem in *any* position. Eliminates packing "drag" and leaks prevalent with conventional packed valves.



. . . and that's not the *only* feature of these SUPERIOR Pressure Cup Valves!

- Seal-cap gasket assures pressure-tight joint.
- Pressure responsive cup forms positive seal.
- Metal-to-metal backseat when valve is fully opened.
- Wrench flats for easy removal of internal assembly.
- Spring assures positive opening under pressure.
- Generous openings assure against pressure drop.
- *Available in sizes through 2⅛" sweat nd and 2" F.P.T.*

If you haven't a copy of Catalog R2, request one today.

No. 117

SUPERIOR VALVE & FITTINGS COMPANY
PITTSBURGH 26, PENNSYLVANIA

OFFICES IN PRINCIPAL CITIES • STOCKS: CHICAGO (6) • LOS ANGELES (15) • JOBBERS EVERYWHERE

SUN LUBRICANTS . . . Are Long-Lasting, Reliable

Especially Refined For Every Make, Size or Type of Refrigerating Equipment

Here is a case history of interest to every servicer and user of refrigerating equipment, large or small.

An internationally known cold storage and warehousing firm was bothered with ammonia losses from a big two-stage compressor, caused by gum and carbon formation on rod packing. Sludge formation in the crankcase was heavy.

Ammonia losses decreased greatly after they switched to Sun's Solnus oil. The split-type, rod packing, which had gummed up and caused the trouble, now stays clean. Rings, valves and crankcase are cleaner, over-all operation more efficient.

These concrete results are typical of the performance of Sun's specially prepared refrigerating oils for cold storage plants, lockers, commercial and domestic air-conditioning and refrigerating systems.

You can use these oils with perfect confidence that they will give your customers the maximum in protection. They resist oxidation and sludge formation, remain fluid at specified low temperatures, are unaffected by sulphur dioxide and other refrigerants.

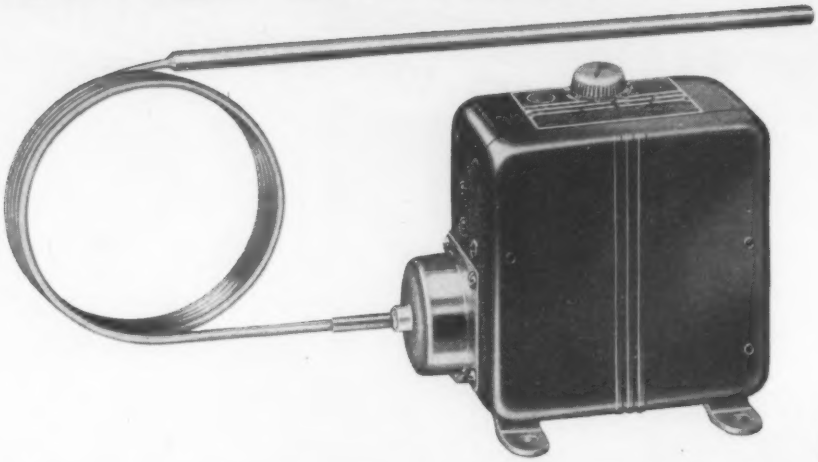
Suniso oils were especially developed for refrigerating equipment and are available in a number of grades for every make, type or size of equipment. They are packaged in 1, 5 or 10 gallon containers, or 50 gallon drums. For further information about Suniso oils, or Sun greases and lubricants for engines, generators, motors, pumps and other industrial equipment, write direct to . . . .

SUN OIL COMPANY • *Philadelphia 3, Pa.*
Sponsors of the Sunoco News Voice of the Air—Lowell Thomas

Send for "Air Conditioning and Refrigeration" Bulletin on valuable lubrication pointers.

SUNOCO **SUN INDUSTRIAL PRODUCTS**
OILS FOR AMERICAN INDUSTRY

Stop spoilage and waste...



with proper temperature control

• Food is critical! Yet much of it is lost through spoilage and waste. These inroads into our food supply could be largely checked by proper temperature control in refrigeration.

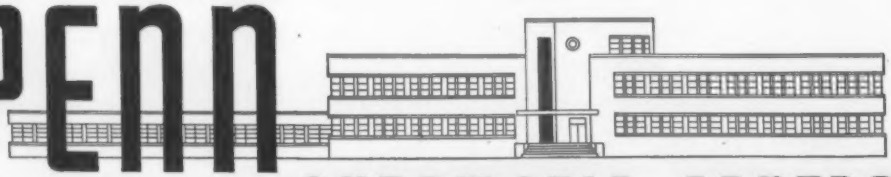
It was to give commercial "above-freezing" installations the highest degree of protection possible that PENN developed AVRGAIRE . . . a single temperature element control. Influenced by the average temperature of both coil and air, this low-cost, highly-efficient control maintains extremely close regulation of box temperature.

When the box load is normal, AVRGAIRE defrosts the coil on each operating cycle. *Defrosting is delayed,* however, when the box is loaded with warm produce and extra cooling capacity is necessary. Humidity is accurately controlled to minimize dehydration and "sliming" losses.

Don't be satisfied with half-way measures in your refrigeration installation—see that your controls give complete protection. Get the full story on AVRGAIRE, complete with pictures and diagrams.

Write *Penn Electric Switch Co., Goshen, Ind.* Export Division: 13 E. 40th Street, New York 16, U.S.A. In Canada: Powerlite Devices, Ltd., Toronto, Ontario.

PENN



AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

BTU's

News • Laws • Trends

RECONVERSION AID

HOUSEHOLD AND COMMERCIAL refrigeration equipment makers both are eligible for reconversion aid from WPB in the matter of machine tools, but ratings are being granted only for those items the lack of which would threaten to hamper reconversion.

Applications for additional plant facilities also may be made. Studies of the probable needs of the industry are being made, and will be announced soon.

POSTWAR MARKET

REFRIGERATION EQUIPMENT figures prominently in the postwar plans of more than 2,700 retail food establishments reporting in a recent survey made by "Progressive Grocer" magazine.

Of stores reporting, 14.3 per cent said they definitely planned to buy walk-in coolers postwar; another 11.4 per cent were interested, but had not definitely decided. Standard-type meat cases were on the purchase list of 12.3 per cent of the stores, while 12.2 per cent will buy open-type self-service frozen foods cases, compared to 10.3 per cent who prefer the pre-war type.

Refrigerated produce cases were on the list for 11.2 per cent of the stores, while 14.2 per cent intend to buy dairy cases, of either wall or floor type.

Of the total refrigeration units to be purchased, 35 per cent will be by stores employing from four to six persons, and another 31 per cent by stores with three employes or less. In contrast, only 15 per cent of the sales will be to stores with 10 employes or more.

Only 3.6 per cent of the stores definitely plan to add a locker plant to their present set-up, but another 5.9 per cent are interested. Air conditioning systems will be added by 7 per cent, with another 5.8 per cent interested by undecided.

LOCKER PLANTS AND OPA

FOLLOWING RECENT OPA investigations of the operations of frozen food locker plants, Louis R. Uhrig, president of the National Frozen Food Locker Association, stated that while traces of hoarding and black market possibly exist in some plants, by and large the meat stored in the plants has been placed there legally by farmers who produce their own food supplies.

If OPA agents were to check all other means of meat storage, including small stocks in home refrigerators, they would find an equal proportion of hoarding and black market activity, Mr. Uhrig said. Total amount of meat now stored in locker plants accounts for less than one week's supply for the entire nation, he estimated.

COMBINATION UNITS

COMBINATION REFRIGERATOR-FREEZERS will become standard in homes within a few years, believes Ward R. Schafer, Hotpoint sales vice president. A unit of this type contemplated by his company, he said, has 8 cu. ft. of 50° and 2 cu ft. of zero-temperature space, with a separate compressor for each.

FROZEN MEALS

NEW DEVELOPMENT in the food freezing field, announced by Maxson Food Systems, New York City, includes a variety of partially pre-cooked meals, which are packaged as individual servings, frozen by a special process, and stored for eventual use. To serve, the user finishes the cooking in a few minutes, a special oven for which has been developed by the company.

Full production at present is going to the armed forces. Postwar, air lines as well as housewives are expected to be users of the quick-meal process.

WATER COOLER STANDARDS

A RECOMMENDED COMMERCIAL standard for self-contained mechanically refrigerated drinking water coolers (TS-3921) has been developed by the National Bureau of Standards and is now being circulated to the trade. Copies of the recommended standard may be obtained by writing to the Bureau of Standards, Washington 25, D.C.

EXPERIMENTAL MODELS

WPB HAS RELAXED restrictions on the production of experimental models through amendment of Priorities Regulation 23. Experimental models may now be made without regard to the $5,000-per-month limitation formerly imposed, and also may distribute them for the purpose of promoting sales and creating consumer demand.

The restriction on showing of models to the trade or the public also has been removed. However, such models may not be made solely for display purposes.

REFRIGERATOR NEEDS

OCR HAS SET the quota on the number of household mechanical refrigerators necessary to maintain a minimum civilian economy at 300,000 per quarter, and has submitted this recommendation to WPB's executive committee. It is expected that WPB's final decision will be close to these figures, and that priority assistance will be given manufacturers to assist in their production.

FROZEN FOODS

A "FROZEN FOODS INSTITUTE" has recently been formed by several leading department stores for the purpose of gathering and disseminating among its members information relating to processing, distribution, and use of frozen foods.

Principal function of the Institute, it is indicated, is to determine the part department stores can play in frozen foods distribution. Emphasis will be on the food itself, rather than on equipment for home storage, although this latter factor doubtless will come in for

Continued on page 42

How to Fit PISTON PINS

● Worn piston pins are a major cause of compressor noise. Here are the fundamentals involved in fitting them right

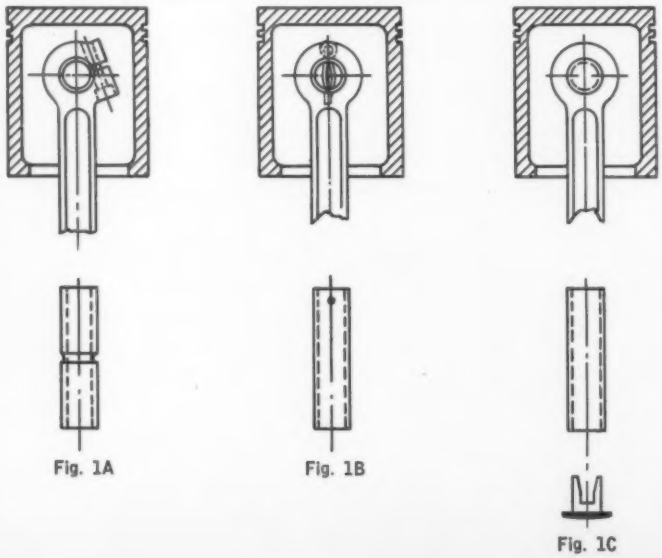
By Edward A. Wenk

WITH the exception of rotary and centrifugal type units, every refrigeration compressor has one or more piston pins. Worn piston pins are responsible for more noise in compressors than any other single factor. As the speed of refrigeration condensing units increases, there will be more piston pin wear, more noise, and more necessity for the replacement of the piston pins.

Until recently, speeds under 500 r.p.m. were the rule. In the future, it is likely that speeds up to 3000 r.p.m., or even more, may be expected. At such high speeds it will be necessary to provide full pressure forced-feed lubrication to the piston pins, in much the same way as is done in the manufacture of automobile engines. In the automotive field, it has been found that after a car has been operated for twenty-five thousand miles, the pins have worn sufficiently to cause noise and require replacement.

Based on a speed of twenty-five miles per hour, which is a reasonable premise, twenty-five thousand miles will amount to one thousand hours of operation. Few people realize the amount of time a refrigeration condensing unit must operate in order to perform its task. A low operating average is ten hours a day. Using these figures as a basis, we can estimate that the piston pins in the high speed condensing units of the future may require replacement *in approximately one hundred days.*

This may seem incredible, but the modern automobile represents one of the highest developments of modern materials and production methods. It is not likely that the refrigeration industry will be able to improve much on the automotive product. A piston pin subjected to the same speeds and the same stresses can be expected to wear the same, either in a refrigera-



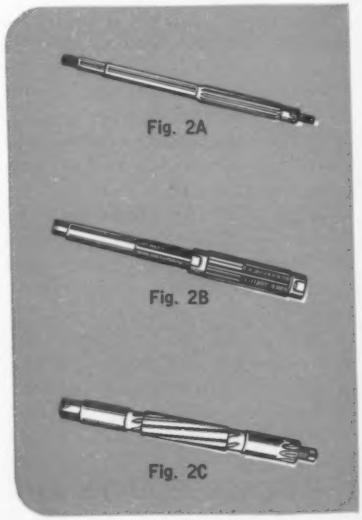


Fig. 2—Types of hand reamers. (A) Valve guide expansion reamer; (B) adjustable hand reamer; (C) spiral expansion type reamer.

Fig. 1 (left)—Methods of securing pins in pistons. (A) pin grooved in center, clamped in rod; (B) pin fastened in piston, bronze bushing in rod; (C) pin not fastened, brass plugs in ends.

tion pump or an automobile engine.

Inasmuch as piston pins will continue to exist in all reciprocating refrigeration pumps, including sealed units, it would be wise for every service man, field or shop, to master the fundamentals involved in fitting piston pins.

The illustrations show various methods used to secure piston pins in the pistons of refrigeration pumps. Some manufacturers have used the same method in all their pumps. Others have tried several methods. Probably the most used method is shown at Fig. 1A. This method is also used extensively in automobile engines.

Testing for Wear

Before removing the piston pin from the piston, hold the piston firmly in one hand and the connecting rod in the other. Try swinging the connecting rod in a plane parallel to the axis of the piston pin. If it moves, or a slight noise is heard, the pin is worn, and must be replaced.

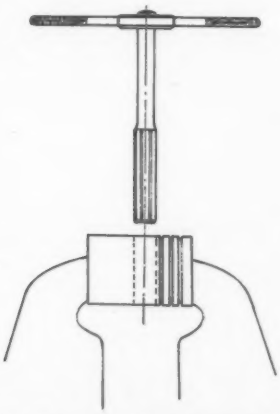


Fig. 3—Reamer held in tap wrench. This is the standard method of holding a reamer.

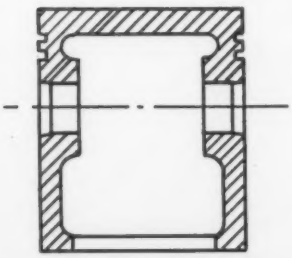


Fig. 4—Cross-section of piston parallel to axis, showing bell-mouthing at ends of pin hole.

Remove the pin; wear marks can be observed or felt with the fingers. If the pin holes in the piston are not worn egg-shaped, it may be possible to use a standard size piston pin, as it is usually the pin that wears. Otherwise, it will be necessary to use oversize pins.

Fitting oversize piston pins is a job requiring exactitude and precision, since the life of the job will be determined by the amount of bearing surface provided in the pin hole. Any metal bearing consists of hills and valleys. The bearing surface is provided by the hills, and the fewer valleys there are, the more bearing surface there will be. The more bearing surface provided, the longer the pin will wear.

In the hands of a skilled mechanic, a new or correctly sharpened hand reamer will produce about 25 per cent bearing surface. That is, only 25 per cent of the total bearing area will be in contact with the piston pin. Remember, that this is under ideal conditions, and most of the conditions encountered in refrigeration service shops are far from ideal.

Machine vs. Hand Reaming

The best way to fit a pin requires the use of a machine called a pin hole grinder or precision hone. Using this machine, an experienced operator can get up to 90 per cent bearing surface, and the resulting job provides a quieter, easier turning pump, and much longer piston pin life.

This method is used almost exclusively in fitting motor car piston pins, and in all likelihood will have to be used on the high-speed refrigeration pumps to be expected in the future. If the service man does not have access to one of those machines, it will be necessary for him to ream by hand.

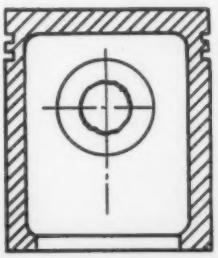


Fig. 5—Cross-section of piston at right angle to pin axis, showing corrugations made by reamer.

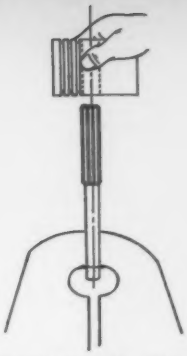


Fig. 6—Reamer held in vise, piston by hand. Amount of power that can be applied is limited.

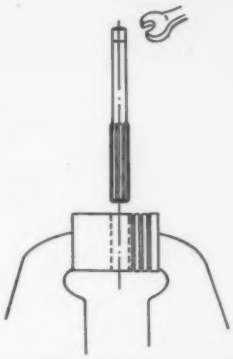


Fig. 7—Reamer turned by open-end wrench. This is worst possible (but widely used) method.

Fig. 2 shows various types of hand reamers, all being of the so called expansion type. Ordinary hand reamers, which are made in fractional sizes only, are not suitable for fitting oversize pins. Fig. 2 has a pilot, and can be expanded about eight thousandths of an inch. This type can be sharpened.

Fig. 2B has no pilot, and is of the type known as an adjustable reamer. The blades can be sharpened or replaced. The total expansion is about one sixteenth of an inch. Fig. 2C is similar to Fig. 2A, but has spiral blades, and is useful when the pin hole is slotted or split, as in the case of a connecting rod.

Methods of Hand Reaming

A reamer cuts or shears away the metal in the hole in which it is turned. If the reamer is sharp, and the cut and feed light, the cutting action will leave a clean round hole. If the reamer is dull, or the cut is deep, or the feed is heavy, the metal will be torn

E-937—10 Bod Bk. on 11 Baldwin

Continued on page 37

L-38 IS OUT . . . . . BUT RATINGS AREN'T

How to fit your business into the rapidly changing priorities picture

WHERE does your business fit into the rapidly changing reconversion picture?

With the revocation of Order L-38, Order L-126 and its schedules, and the recent issuance of Direction 1 to P-126, Direction 10 to Priorities Regulation 3, and the amendment of Controlled Materials Plan Regulation 9A, the average refrigeration man can scarcely be blamed for being just a little confused. Where, he wants to know, does he stand now—how much difference does it make in his way of doing business?

Here, in brief form, are some of the answers to those questions:

The revocation of L-38, effective May 12, won't mean much immediately. It will probably be the fourth quarter of 1945 before production for unrated orders will amount to very much. What WPB's action meant to manufacturers, in effect, is this: Go ahead and make all the products you can from the materials you have in inventory. You can sell them without ratings, but rated orders must be filled first, under provisions of PR 1. *So it is still a wise policy to secure as many rated orders as possible. Otherwise, your supplier may not be able to obtain the materials you want without a long wait.*

Programmed refrigeration items—display cases and milk coolers, for example—are not affected by the revocation of L-38. Manufacturers who have been allotted materials to use in those programs cannot switch their production over to another product and use those materials to make it.

However, if a manufacturer authorized under the display case program can make more of these units than his original quota called for, there's nothing to stop him now that L-38 is off the books.

There has been no change in L-5-c, the order governing household refrigerators, and this control is likely to be continued, although production of 530,000 units has just been O.K.'d to fill urgent essential needs.

As far as repair parts are concerned: P-126 remains in effect. Direction 1 (reported in last month's issue) prohibits the use of P-126 ratings to get any new condensing unit, cabinet, or any other insulated enclosure, any new low side units (such as unit coolers) or any new system containing any of these items.

CMP Regulation 9A, amended May 9, specifies that "no repairman may use the AA-3 rating assigned by this regulation to buy . . . refrigeration condensing units, low side units (such as unit coolers), cabinets or other insulated enclosures." Direction 10 to PR 3, issued May 12, continues in effect the restrictions on the use of MRO ratings formerly contained in L-38. This means that blanket MRO ratings may not be used to get any new system, condensing unit, compressor unit, etc., or any reconditioned system, unless it replaces one of the same size and capacity worn out or damaged beyond repair . . . after the purchaser has had it in use for at least 90 days.

The tabulation on this page was prepared by the Electrical & Mechanical Repair Section of OCR, and summarizes ways to get materials for maintenance and repair work. If you are in doubt as to what to do, by all means see your nearest WPB office.

HOW TO GET MATERIALS FOR REPAIR WORK

Nature of Work	How to Obtain Controlled Material Items	How to Obtain Other Material and Items Needing a Rating
1. For businesses specifically listed in CMP Regs. 5 and 5A	By using customer's MRO Allotment Symbol, See (g-1) of CMP Reg. 5 and (h) (2) of CMP Reg. 5A	By using customer's MRO rating. See (g-1) of CMP Reg. 5 and (h) (2) of CMP Reg. 5A
2. For businesses not specifically listed in CMP Regs. 5 and 5A		
(1) For larger maintenance and repair jobs.	Customer may file WPB-541 for right to use customers' MRO Allotment Symbol. See (j) of CMP Reg. 5 and (k) of CMP Reg. 5A. Repairmen can use Allotment Symbol of CMP Reg. 9A if he wishes.	By using rating assigned by CMP Reg. 9A
(2) For small maintenance and repair jobs.	By using Allotment Symbol of CMP Reg. 9A	By using rating of CMP Reg. 9A
3. For civilian, maintenance and repair work	By using Allotment Symbol of CMP Reg. 9A	By using rating of CMP Reg. 9A
4. For industrial and commercial refrigeration and air conditioning equipment	By using MRO symbol of P-126 (allotment symbol of CMP Reg. 9A may be used if repairman wishes)	By using proper rating of P-126 (Preference rating of CMP Reg. 9A may be used if repairman wishes.)

In all cases the prescribed form of certification should be used.

DAVISON'S SILICA GEL

goes further . . . does more

Davison's Silica Gel was developed under close collaboration with refrigeration engineers who knew only too well the short-comings of ordinary drying agents. . . . Recognized as a basic contribution to the refrigeration industry, Davison's Silica Gel ends moisture troubles and other danger-creating elements that stop most drying agents. . . . It is the complete drying agent, as these advantages found in Davison Silica Gel prove.

1 It is processed especially for the dehydration of refrigerants.

2 Its scientifically-determined particle size assures you that the refrigerant will not channel — will be distributed evenly throughout the cartridge.

3 This even distribution of the refrigerant makes it possible for it to be in complete contact with the entire pore-surface area at all times.

4 It removes acids . . . corrosive compounds and other impurities . . . in addition to moisture . . . instantly.

5 Its capacity for moisture is not affected by oil.

6 It will not cake nor powder.

7 It will not attack metals or alloys.

To get this COMPLETE DRYING AGENT that is effective on Freon, Methyl Chloride, Sulphur Dioxide, etc., specify Davison's Silica Gel from your jobber . . . in factory-charged dehydrators or in bulk for refill.

THE DAVISON CHEMICAL CORPORATION

Progress through Chemistry

BALTIMORE-3, MD.

Canadian exclusive sales agents for DAVISON'S SILICA GEL: CANADIAN INDUSTRIES LIMITED, General Chemicals Division

Yes, our arithmetic's correct!

One Alco "TK" THERMO Valve — plus these two little discharge outlets — is equal to *three* different sizes of ordinary valves.

By merely screwing a little discharge tube into the outlet—you can change the capacity in 10 seconds ON THE JOB. Only one valve to carry—think of the savings in storage, time, and labor. See your Alco jobber.

VARIATIONS	NOMINAL CAPACITY IN TONS	
	METHYL CHLORIDE	"FREON-12"
1. Without tube	2.30	1.15
2. With "O" tube	1.00	.50
3. With "OO" tube	.52	.25

ALCO

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Designers and Manufacturers of Thermostatic Expansion Valves; Pressure Regulating Valves; Solenoid Valves; Float Valves; Float Switches.

Get-together IN MILWAUKEE

Contractors have found war-time cooperation so worthwhile they've put it on a permanent basis

VOLUNTARY cooperation among reputable refrigeration installation and service contractors to foster "fair competitive opportunities" and to raise the level of refrigeration work in their community, keynotes the aims of the Refrigeration Service Association of Milwaukee.

Organized as a direct outgrowth of the war-time Emergency Council of the industry's national manpower and training program, the Milwaukee association already has under way a sound program of trade practices and education designed to benefit both the industry and the public.

Present membership in the organization comprises fourteen of the city's installation and service contractor firms. President is John J. Geering, veteran refrigeration man, who also headed the Emergency Service Council; Fred E. Boehme, another independent contractor, is vice president; Elmer Fenton, of Roth Appliance Distributors, is secretary, and Ellsworth Anderson is treasurer. Membership is restricted to firms having their own shops.

As one of its initial accomplishments, the Association has had adopted by its member-contractors a schedule of standards covering hours of work and rates to be charged for maintenance calls on all types of systems. According to the schedule, calls answered between 8 A.M. and 5 P.M., Monday through Friday, are to be assessed the regular labor charges. Calls made after 5 P.M. on week-days and on Saturday may be charged for at time and one-half; and Sunday and holiday calls are double time.

All estimates for service repair work are to be charged for at regular rates. A standard 90-day guarantee on all new parts applies (exclusive of labor) except in cases of complete overhaul of assemblies. In these jobs, guarantee is not to exceed one year.

Working in close cooperation with the Better Business Bureau in tracking down and dealing with complaints of overcharges and other malpractices is another important segment of the Association's work. Cases of this type are now cleared with the Association as a matter of course, and as a result of its efforts adjustments have been made in a number of instances.

The Association's most important program, at the moment, is sponsorship of a city licensing ordinance, modeled closely after the legislation put into effect in Detroit some years ago. In addition to providing penalties for bad practices, the ordinance, if approved, would require that a refrigeration contractor prove at least three years of experience to qualify for licensing, and that, in the case of persons with less experience than required, the employer be responsible for the work done.

As evidence of the value which they place in the Association and its work, all members display the emblem of the organization prominently in their classified telephone section and other advertising. A specially prepared series of cooperative newspaper advertisements last year, appearing during the peak season, explained the importance of the work refrigeration firms were doing, and told how shortage of trained men made it impossible to answer service calls as promptly as in normal times.

Future association plans include, besides within-industry training for new men, a "brush-up" course for experienced workers, to keep them abreast of the newest developments in refrigeration. These meetings, if plans materialize, would be held twice a month and would feature talks by various manufacturers' men.

The Association's emblem is featured in members' advertising, and it has its own listing in the phone book.

Service DOOR TO SALES

"I BELIEVE that any good refrigeration and appliance merchandising outlet must have good service as a basis. Many dealerships go at it from the merchandise side, and gradually work into the service end. We are doing it the other way 'round.

"We are already well established as a servicing business. From this basis, and on the reputation we've made in it, we're going to build our postwar merchandising business. Our lines are out—and already we've made some contacts that will bring some top-rank lines into our selling setup."

So says E. H. Colestock, manager of the Koolaire Refrigeration Co., St. Paul, Minn. Far from being stopped when new equipment went off the market after the war's start, he has expanded his maintenance operations to the point where some 14 men are employed, as compared with four in pre-war days. The firm has developed a complete machine shop.

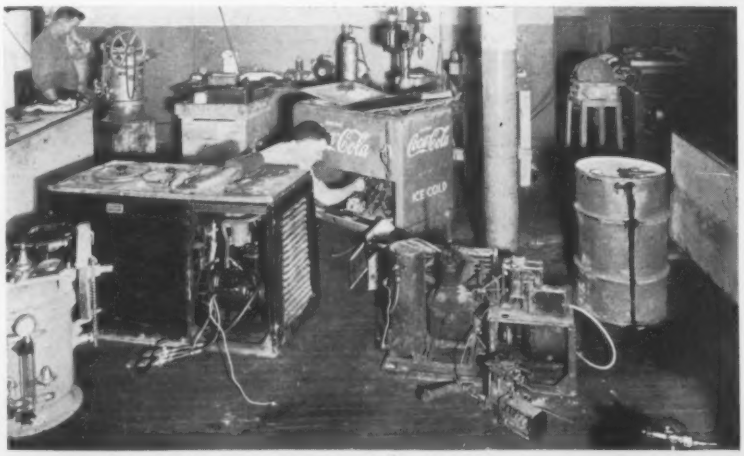
•

"We have machine tools, and complete welding equipment so that we are able to fabricate anything that is necessary to replace worn parts", Mr. Colestock says.

Koolaire Refrigeration, which has been operating in the vicinity for about thirteen years, moved to its present location a year ago in order to have facilities for its rapidly expanding business in repairs.

Customers are told before a refrigerator is serviced that charges for repairs are made on a time and material basis. This, Mr. Colestock believes, is the only way that repairs can be made and the business continue. Repair cost in some cases may be in excess of cost of replacement in normal times, but repair is necessary to keep equipment operating.

Even so, there is much equipment



Workmen inspect a beverage cooler in a corner of the Koolaire shop; an ice cream cabinet, shown in left foreground, also is in process of being tested after repair.

All types of commercial equipment are handled by Koolaire. Here a mechanic assembles cold plates, while a second busies himself at one of the motor repair benches. The company makes its own parts, if new parts cannot be obtained.

which cannot be rebuilt because of cost and re-sale restrictions. "We have a great deal of equipment in our storage house which should be in use," said Mr. Colestock. "But like most other places operating on a large scale, it is lying there unused because we cannot afford to rebuild it."

In expanding its place of business, the company spend a good deal of money from which it does not expect to make an immediate profit, but which it anticipates will pay off, and then some, when it has established its refrigeration and appliance dealership in the postwar period. Ranges, washers, ironers, oil burners and stokers will be added to refrigeration equipment. The store was set up to service oil burners and stokers last winter.

Postwar plans of the Koolaire company include sale and installation of home air-conditioning systems, which Mr. Colestock believes will eventually be a big field for the firm. He believes air conditioning will be included with home heating as a part of many builders' contracts.

The completely equipped maintenance shop is on the second floor of the large, modern building which houses the company. Here are employed the fourteen men who handle the service work. These men are all trained by Mr. Colestock in regular classes.

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To cope with wartime conditions, Koolaire expanded its operations to include complete machine shop facilities, welding equipment.

"We conduct a school for our employees two nights a week throughout the winter months," he says. "We give basic theory for two months combined with shop work. During the day we tie-up the service work with the class work, to give beginners the opportunity to progress in their knowledge as rapidly as possible. Our classes are carried out on the same lines that those of a trade school are conducted."

In teaching, Mr. Colestock takes the service man's problems from the field and goes through them with the class. "There is no better way to show how to deal with problems which may confront a man on the job," he says. A concrete example will be discussed. The class will be shown what should have been looked for to give correct service, in case it is a problem where the work is more than usually complicated. Frequently a machine will be brought into the shop for class demonstration purposes.

The shop has an interesting group of workmen of varied nationalities. One of the workmen is from Russia, another from Newfoundland. All appreciate the care that is taken to prepare them for the service work, and look forward with confidence to steady employment as they view the company's plans for expansion. There is a fine feeling of cooperation between the workmen and the company.

The company maintains four trucks, and plans to put on a fifth in the immediate future. Effort is made

Continued on page 41

REBUILDING THE *Coldspot* UNIT

By Elmer H. Wiedwald

The second of two articles discussing common servicing complaints and shop equipment needed in rebuilding work

NEARLY all Coldspot units, with the exception of the one model having a direct-coupled unit and using only three mounting springs, use one pint of #3 Suniso or comparable oil. Do not use too heavy an oil, as the vanes will not function properly.

Place the dome on the bench and pour in one pint of oil. Wet the new gasket with refrigerant oil and assemble. These Coldspot gaskets can be obtained from most supply houses.

Now to return to the pump. The suction line has given considerable trouble due to vibration cracking the line at the elbow and the solder breaking loose from the fitting. Center punch the 3/8" pipe fitting in the compressor to indicate the direction of the suction line. Unsolder the suction line and take a box wrench and unscrew the fitting. Carefully remove all remaining soft solder with knife or emery cloth. Now take a piece of 3/8" tubing about 5" long and make a 90° bend. Insert the tube in the fitting, allowing a quarter turn for tightening up when screwed back into the compressor casting.

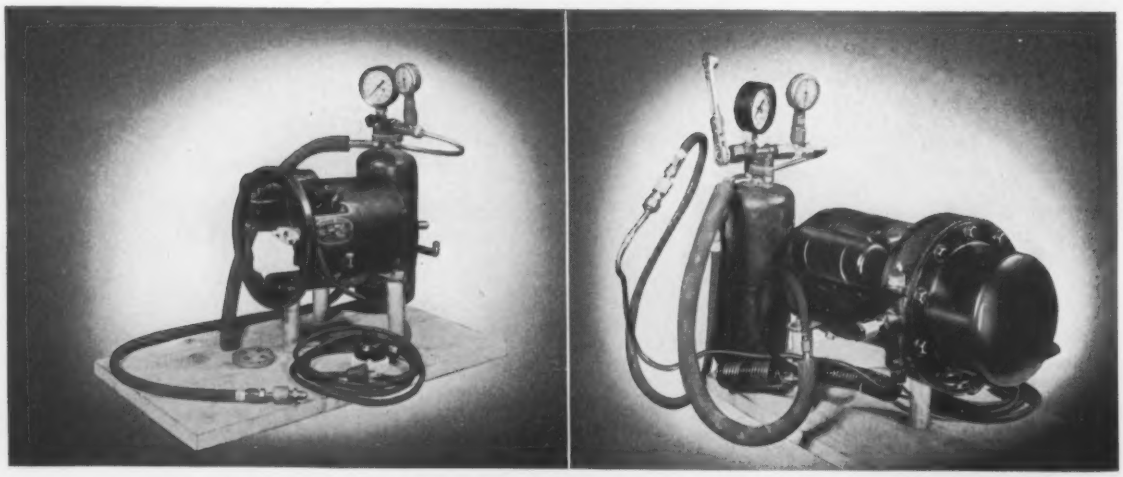
Silver solder the elbow and fitting together with care. Put the pipe compound on sparingly after the first or second starting thread, so that it is not pushed into the inner parts of the compressor and lodges under the check valve. When installing the fitting, tighten carefully so as not to crack the compressor casting, as this is a pipe thread and considerable leverage can be obtained.

Cut off enough of the old suction line to allow for the new elbow and swedge out for silver soldering. Remove the 3/8" pipe plug opposite the suction line and take out the suction check valve assembly. Clean carefully and lap in the check valve disc. Reassemble and screw in pipe plug with caution.

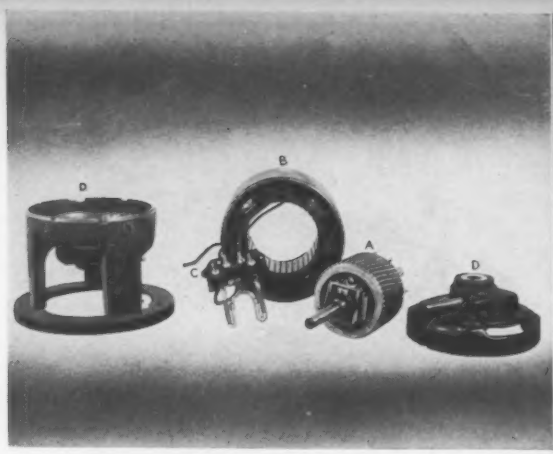
The pump is now ready for testing. Silver solder a short length of 1/4" tubing with a flare nut attached to the discharge line. Leave the suction line as is. A compact test set-up can be made by mounting a Coldspot motor on a suitable board, as shown. This will eliminate the expense of dismantling a unit after it has been baked out and charged, and then found inefficient. Build up the head pressure to at least 125 lbs. and with a good vacuum gauge on the suction line, it should pump down to at least 28" of vacuum in a second or so. When the pump is shut off, the check valve should hold this vacuum. Sometimes the check valve will leak. Start and stop the machine a few times and it will usually clear itself out.

If the compressor will not pump up to 125 or 150 lbs., the following things may be at fault: If the oil is too heavy or the room temperature too low, the vanes will be unable to fly out and bear against the cylinder wall by centrifugal force. Since the vanes are constructed of an aluminum alloy and are necessarily light, heavy oil will make the vanes stick in the rotor and if the suction line is open, will give a loud popping noise much like a motor boat.

If the cylinder has not been assembled close enough to the rotor, the large clearance will allow the discharge vapor to circulate on to the intake and result in an inefficient pump. However, allow the oil to warm up to at least 80° before condensing the pump for tear down. Since the vanes are matched to the slots, this will sometimes give trouble if the operator has not been careful. Some vanes are wider than others, and when installed in the wrong slot, the clearance would have to be increased between the rotor and cylinder to allow this vane to pass by the discharge port. Naturally,



Test set-up for Coldspot units. At left, test unit mounted on board. Right, unit with compressor in place.



Motor parts (left): (A) rotor; (B) stator; (C) stationary switch; (D) end bells. At right, Coldspot compressor parts: (A) rotor; (B) back bearing plate; (C) cylinder; (D) muffler; (E) oil baffle; (F) oil intake screen; (G) check valve cage; (H) vanes.

the other three vanes will then have too much clearance and the pump will be inefficient.

If the check valve persists in leaking back, the assembly will have to be removed and re-lapped. However, very little trouble will be experienced at this point. Check for dirt on the valve seat.

If the compressor pumps up to 150 lbs. and pulls 28 inches of vacuum, bypass the high low side and allow the compressor to run at 6″ vacuum back pressure against a 100 lb. head pressure. At this point, the pump should be very quiet. Let the compressor run for about 10 to 15 minutes for the seal to run in. Check the efficiency again; if o.k., remove from test board. Remove dome, dump out oil and replace with new charge. Since the oil cooling coil is of small diameter, carbon will lodge at this point and during run will work out into the dome. This procedure will add to the life of the pump.

Testing for Leaks

Silver solder a ½″ piece of tubing on the ⅜″ suction line. The pump is now ready for submerging for leak test. Check under water with at least 125 lbs. pressure. Leaks, if any, are usually found at the seal, suction line fitting, and discharge line where it is soldered into the fitting at the compressor casting. This is a soft soldered joint, and can be re-soldered with the pump still assembled. If the seal leaks, run the compressor in for another 10 or 15 minutes, and this will usually correct the trouble.

If no leaks are found, bake out the pump for at least eight hours at 210 to 220° at 29″ vacuum. If care is used when dismantling the unit and the lines are capped immediately, the entire unit will not require baking out on re-assembly.

Motor Repair Problems

Now for the motor. If you have had no experience with motors, it is best to turn this work over to a reputable motor repair shop. Nearly all Coldspot motors are of the capacitor start induction run type, and as such, the troubles will be identical with the conventional type of household motor. In all cases, tear the motor down completely and check all parts. Capacitors should be replaced in all instances to forestall future trouble. Check bearings for wear; if worn, replace. On Delco motors, the governor throw-out spring may become weak. In most cases, all these springs should be replaced. Be sure to put a drop of oil on the governor hub where it rubs against the shaft, to prevent binding at this point after the cleaning solvent has dried up.

If the contact points in the switch can be cleaned and the governor bearing surface is all right, the switch can be re-used. If not, replace it and all dried-out and cracked motor leads. A new switch is cheap insurance against a flare-back.

With late model G-E motors, the centrifugal governor switch may give trouble. In this case, install the old style governor and switch, as they are interchangeable. If the motor is burnt out, it can be replaced very reasonably at any G-E service station under the company's fractional motor exchange plan.

On Emerson motors, the normal troubles may involve capacitors, switches and bearings. If the bearings need replacing, be sure to use a line reamer when reaming to size. In some cases, the customer will oil the motor with linseed oil, which does no end of damage. In such an event, bearings and wicking must be removed and the end bells boiled in lye or sodium metasilicate to remove the residue. New bearings and yarn should be used when re-assembling.

All motors, when assembled, should be tested under full load current with the Prony brake, or other suitable test equipment.

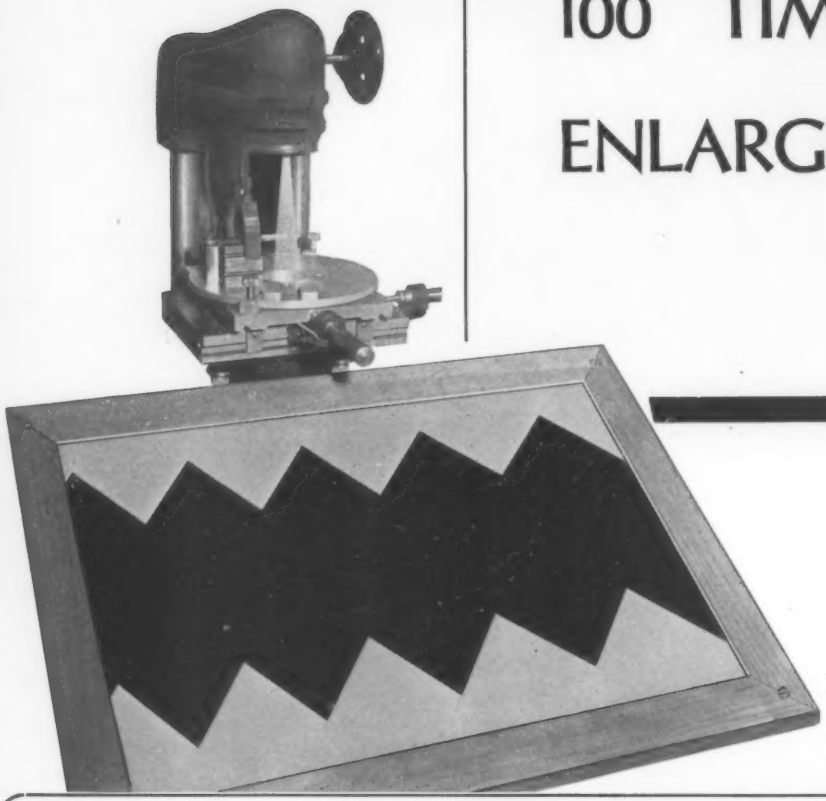
Re-Assembly Method

When the pump has been baked out, remove the ¼″ and ½″ lines and silver solder back to original connections. Since the condenser tubes are steel, use caution in silver soldering, to prevent splitting the steel tube. Assemble the motor and replace or repair any defective wiring. Allow ⅛″ clearance between the fibre coupling and motor drive. Be sure to fasten the Allen set screw in the motor drive securely, as this can be a source of trouble. Check the fan blades where they are peened on to the hub. If loose, they can be hammered securely should the hub be aluminum. If the hub is steel, the blades and hub can be spot-welded together.

The unit is now ready for evacuation and charging. Since some sulphur may be left in the machine, use two machines, if available, for evacuation. A reciprocating compressor can be

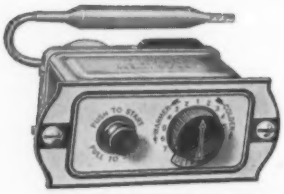
Continued on page 56

100 TIMES ENLARGED



In the production of Ranco Commercial and Domestic Refrigeration Controls certain parts are inspected by this instrument which projects a silhouette of the part 100 times enlarged. This is indicative of the extreme care used in the manufacture of Ranco controls . . . it is your assurance that your installation of a Ranco Refrigeration Control will bring no regrets . . . that it is a precision instrument; alert, responsive, accurate.

And, in addition, Ranco Controls are attractively designed and constructed. You can be proud, as well as confident, when you install Ranco.



Ranco Inc.

COLUMBUS 1, OHIO

Ask Your Ranco Jobber

"Let's share our knowledge—exchange our experiences"

Here's how

Edited by
Warren W. Farr

Your Order, Please

With this issue, this department begins its second year of service to refrigeration installation and service contractors. We've tried to bring to both beginners and old-timers in the field practical ideas that can be applied to every-day jobs—ideas that would save you time and money, that would help you expand your activities into new and profitable sales and maintenance fields.

In articles elsewhere in the magazine, we've published technical data, installation stories, and information on operating methods and ideas which have been used with success by dealer-contractors in various sections and under various conditions.

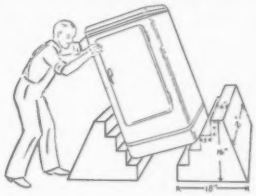
We're planning to keep right on doing this—but you can help us to do a better job by telling us what type of information we can supply you with to best serve your needs. Tell us what you want—we'll get it for you.

Service Aids

One of the most common service aids supplied by manufacturers on condensing units consists of a liquid refrigerant test cock. These are of many types, and range from a common radiator cock located at liquid level to small valves of various types mounted on a tube which extends to the liquid level.

These refrigerant test valves, when opened, will vent liquid refrigerant if the liquid reserve is up to a predetermined normal point. If the level of the liquid is low, only dry gas will blow out of the valve.

A device of this kind on the condensing unit receiver permits the service man to check the refrigerant charge in a few seconds. However, in making these tests, always be sure that the machine has run for a period of time beforehand, and make certain that the test cock is tightly closed after the test has been completed.



Steps to Better Service

Here is a make-it-yourself piece of shop equipment of definite value to shops working on household refrigerators and other unit-type equipment. It was submitted to this department by Lester A. Bill, of St. Johnsbury, Vt.

"A refrigerator brought into the shop for any considerable amount of service can be worked on much more conveniently if raised 12 to 15 inches above the floor, thus allowing the service man to use a stool.

"One man can easily raise a box to this height by the use of two small sets of 'steps' built to the approximate dimensions shown in the sketch.

"By rocking the cabinet from one side to the other and pushing the 'steps' in one step at a time, any ordinary household unit can be raised easily and safely to a convenient height by one workman."

Now It's Your Turn

The servicing short-cuts we've published on these pages have brought to busy refrigeration mechanics valuable information on new shop methods, new servicing tools—How-to-Do-It information that has saved them both time and money. We know this is so, for hardly a day goes by without a letter from some reader telling us how much this data has helped him in his work.

What helps one, helps all—so here's another invitation to share your servicing experiences with us. For each idea used, we'll send you your choice of either $5 or a copy of "Modern Electric and Gas Refrigeration," by Althouse & Turnquist. Address Here's How Editor, The Refrigeration Industry, Cleveland 15, Ohio.

More on High Side Floats

A letter from Jack Matchett, of Matchett Marine & Electric Co., Sturgis, Mich., supplements Joe Gerson's "I Do It This Way" contribution published in the May issue, on adding oil to high side float Frigidaire compressors. Writes Mr. Matchett:

". . . . Almost without exception, an oil shortage in the crankcase of the Frigidaire high side float compressors is caused by a refrigerant shortage. Even a very slight shortage of refrigerant will cause the oil to leave the crankcase, over a period of time.

"Lack of oil does contribute to the complaints he (Joe Gerson) lists, but adding more oil is only a temporary relief and is apt to cause an oil logged freezer or lead to oil slugs returning down the suction line and breaking the compressor valves. If the refrigerant charge is put back to normal, the oil will return and a sufficient quantity will remain in the crankcase.

"If the system is short of refrigerant," Mr. Matchett continues, "no additional oil needs to be, or should be, added to the system. These systems have a correct refrigerant charge when the suction line is frosted about 4" out of the freezer head at the end

of the running cycle, with the cold control on No. 1 position.

"High side float systems are excellent outfits when working correctly, but suffer more from improper servicing than any other type of system in existence."

Tube Flaring

Here is a mighty good suggestion on flaring old and hard copper tubing. If you are working on tubing of this type and the flare keeps splitting, try heating the section you want to flare to a dark cherry red heat, and then allow the tube to cool off without quenching. Don't douse it in water.

Such treatment will normalize copper tubing back to original softness, and you can then flare it easily.

Coolant Coolers

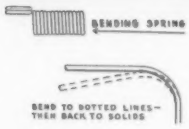
A little-mentioned but highly important use of commercial refrigeration equipment is in plants doing milling and machining and using oil or some other fluid as a coolant.

It has been found that, by keeping the coolant liquids at lower temperature levels, output of the individual machines is greatly increased.

Speeded-up production due to war needs has resulted in the use of refrigeration equipment in thousands of plants and shops in all parts of the country. Naturally this use will be continued and increased in those plants from now on.

So keep your eyes on the plants and shops in your territory who use (or could use) refrigeration. They represent active servicing accounts—and good prospects for additional sales, too.

I do it this way...



MANY times when using an inside bending spring in bending copper tubing, the spring sticks in the tubing and cannot be removed.

I have found that I have few such mishaps, when I keep my bending spring coiled in a can and wipe it with oil each time after I use it.

I replace it when the spring shows signs of opening, kinking or drifting.

When I use a spring I always bend the tubing past the angle that I want it (as shown) and then restore it to the proper angle. This stretches the tube, and removal is easily accomplished.

For those times when this does not suffice, I heat the exposed end of the spring at right angles to form a loop. I then put a pin in this loop and tighten the spring by twisting it. This reduces the diameter, and enables it to be withdrawn.

E. A. Wenk, New York City.

WHEN I have a refrigerator to take into the shop for repairs, to fasten down the unit I use "C" clamps instead of having to look for the bolt that came with the unit or hunt around for new ones.

I find clamps like this mighty handy things to have in my tool kit, since they also can be used for the temporary installations of motors and compressors.

Wm. Schneider, Cloquet, Minn.

Bakery Refrigeration

Refrigeration service men are helping the nation's bakers by keeping refrigeration jobs in first-class operating order in numerous baking plants.

In fact, refrigeration, to the baker, is just about as important as are the baking ovens themselves. Cooling devices of one kind or another are used in making bread, cakes, pastries, and other bakeshop delicacies.

Quick, efficient servicing is required in the event of equipment breakdowns, because of the danger of food spoilage.

Gauge Reading Tip

"In servicing domestic and commercial compressors where the high and low side valves are located on the cylinder head", writes Everett Chase of Redfield, S. D., "I have been fooled by the gauge reading taken at gauge plug opening on lowside service valve, in case the screen located under the discharge plate was clogged or partially clogged.

"Since the gauge opening is ahead of the compressor crankcase in this screen port, the reading taken in the crankcase would be entirely different.

I do it this way...

HERE is a tool which I found very handy in the servicing of refrigerators, like the Norge, the valves of which face toward the front of the unit.

If, as in my case, you are unable

to locate a ¼" socket with ⅜" drive, simply take a midget (¼" drive) 7/16" socket and place it on the drive head of a ⅜" speed wrench.

With this rig, valves can be opened and closed with maximum speed and a minimum of effort.

D. B. Gonzalez Jr., Pensacola, Fla.

One might suspect an inefficient compressor or any number of things by the gauge reading on the service valve.

"To remove any doubt about the screen or reading, I balance the pressure in the compressor as nearly as possible, remove the oil plug, and install a fitting to attach the gauge. This will immediately tell the condition of the screen without tearing down the compressor.

"I hope this experience will be of some value to other service men."

Service DO's and DON'T's

DO:

1. See that coil hangers are securely fastened, and of ample size to properly support the coil, even when coated with several hundred pounds of ice.
2. Check motor for perfect alignment after inspecting an ice machine or changing a motor.
3. Use your head, as well as your tools.

DON'T:

1. Use an emery wheel unless you are wearing goggles.
2. Scatter tools all over the area in which you are working. You may cause someone to fall and be injured.
3. Take anything apart unless you are sure that you have the ability to repair it and replace it in its original condition.

You could call it a "Moisture Eradicator"

HERE you see one of the installations in which Revere Dryseal Copper Tube is dried and sealed — in order to make it perfect for refrigeration, air conditioning, heat control, bottled gas and other exacting services.

This tube is available *now*. It comes in coils of 25, 50, and 100 feet, and each length is individually treated to remove all interior moisture, then sealed at both ends. You get it clean, bright, and bone dry, so that no moisture is present to react with any refrigerants and produce corrosive products.

This is but one of the "kid glove" treatments given Revere Dryseal Copper Tube so that it will serve you better. It is made of deoxidized copper, and is carefully kept free of oxides during every manufacturing step. In annealing this tube to dead softness, for example, the heating is done in a controlled atmosphere.

It comes in sizes from ⅛" to ¾" O.D., with .035" wall. Also available for refrigeration, air conditioning and a variety of other services is Revere Sealed End Copper Tube, which has each end plugged and taped for protection against injury and contamination. Both Revere Dryseal and Revere Sealed End Copper Tube are available from Revere Distributors in all parts of the country. The Revere Technical Advisory Service is always ready to help with your difficult problems.

REVERE

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GREENHOUSE — NURSERY INSTALLATIONS OPEN A NEW FIELD FOR YO

Here's an important—and almost untouched—market for development now and postwar . . . an all-purpose refrigerator to permit storage of produce in unheated buildings

AN important and relatively untouched market open to development by refrigeration contractor organizations is the installation of an all-purpose refrigerator for such users as truck-garden farmers and greenhouse operators, to permit the storage of vegetables and flowers on a year-around basis in unheated buildings.

A recent installation of this type was made at C. R. Perkins & Sons, who operate a number of greenhouses and a large truck garden in Westlake, Ohio.

Large quantities of produce are grown and sold at wholesale by this company to chain stores, and due to holidays and the flooded condition of the market, the demand for this produce is not constant. Often the demand is least when the produce itself is most plentiful. With the cooler as installed, Perkins & Sons are now able to harvest the produce when it is in prime condition, and hold it in this condition until market situation is more desirable.

Flowers are in great demand for holidays and special occasions, and must be held in bud form or partial bloom for these occasions. Flowers are an item which cannot be held back without the use of refrigeration.

C. R. Perkins have discovered another use for the new installation which has not previously been discussed in refrigeration circles; that is the fact that greenhouses plants and nursery stock that are removed from seedling beds for transplanting can be held for a number of weeks in the cooler at 36° F. in a comparatively dormant state. Previously, it had been necessary to heel these plants in furrows, and often they would dry out and a percentage of the total would be lost.

In the construction and installation of the system, it was necessary, due to available building space, to place the cooler in an unheated building located centrally in the greenhouse and nursery property. In engineering the job, it was necessary to take into consideration a number of factors:

Water could not be used as a condensing medium, due to winter freezing.

Provision had to be made to prevent merchandise stored in the cooler from the greenhouses from freezing during the cold winter months.

★

Condensing unit (air-cooled) is protected by a water-proof enclosure for protection from other equipment located nearby. Note extra-large drier used as protection against excessive moisture conditions.

★

MR. CONTRACTOR . . .

It was necessary to design the control system so that the temperature of the refrigerated enclosure could be varied as the stored products varied.

Air distribution from the cooling units had to be designed so that distribution would be even in all directions, and of very low velocity, so that delicate plants and flowers would not be injured.

The entire refrigerated structure had to be protected from field mice and other common farm pests that would seek shelter within the insulated enclosure during the winter time.

The refrigerated enclosure also had to be of ample capacity to accommodate the peak production of the entire greenhouse and truck garden enterprise.

The cooler was constructed of 2-inch cork, laid up in hot asphalt, with all joints broken with respect to each other. The old farm building in which this insulated enclosure was erected first had the inner walls lined with matched sheeting. This sheeting was then covered in its entirety with ¼-inch mesh galvanized wire, as protection against rodents.

The first layer of cork was then applied to this surface. After the second layer of cork was applied, all inner side walls were covered with two coats of cement plaster, the final coat being scored in about 4-foot sections, to control contraction cracking.

Ceiling surface was protected with a ⅛-inch coating of mastic cement. The concrete floor was pitched to the back wall of the cooler, and a 6-inch gutter was provided here, connecting to a 6-inch crock sewer, providing the user with adequate drainage facilities, so that vegetables might be washed in the cooler, and also so that the cooler itself could be flushed down with a hose when necessary.

A door 5 feet wide was provided, so that produce could be brought directly into the cooler on large hand trucks. A water connection was provided within the cooler, so that vases for flowers could be filled and produce could be washed without having to be taken outside the cooler.

Due to the freezing conditions prevalent during the winter months inside

Example of the heater units used on the installation. Control is located within the storage room.

Radial cooling units were selected for this job to insure even distribution of air to all parts of the enclosure.

the building in which the cooler was located, a 3 H. P. Brunner air cooled condensing unit was selected as the high side. By referring to the photo of the condensing unit, it will be noted that a water-proof enclosure has been constructed at either end of the area in which the unit has been located.

This precaution was necessary due to the fact that an automatic machine for washing vegetables was located near the condensing unit. To conserve space, the refrigerating machine was installed under the stairs; the bottom of the stairway also was covered to prevent dirt from dropping on the unit.

Because of the extremely high moisture conditions existing during the installation of the compressor, a drier of unusually large capacity was installed, in addition to which the unit itself was thoroughly evacuated before being started. Adequate air is supplied to the unit during the summer months by opening the windows on the north and west sides of the building.

Low Side Equipment

For low sides, two Kramer radial cooling units were selected. The units are equipped with air conditioning type discharge grilles which provide an even distribution of the air around the entire circumference of the unit. Inlet air is drawn in through the bottom of the unit by a vertical discharge propeller type fan. The cooling surface consists of finned tubing, circular in shape, around the inner circumference of the unit, and liquid and suction connections are manifolded to prevent pressure drop through the cooling coil.

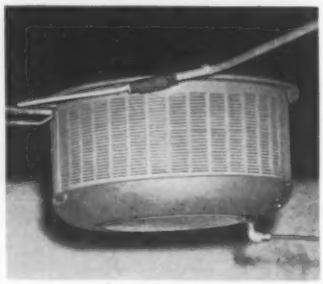
A heat exchanger is provided within the unit, increasing the capacity of this type of installation approximately 10 to 15 per cent.

In mounting the units, care was taken to located them in such a position on the ceiling that the air throw would be equal in all directions, and slow speed fan motors were selected so that air velocity would be held to a minimum.

Temperature of the storage room is controlled by an adjustable type White-Rodgers hydraulic action temperature control, and the control itself is located within the insulated structure, so that varying ambient temperatures outside would have no effect on the operation of the device. Control dial is calibrated in degrees from 34° to 54°, so that the user can change the temperature by merely shifting the control indicator to accommodate different products stored at different times throughout the growing season.

To prevent freezing within the cooler during the winter months, it was determined that electric heaters with a capacity of approximately 750 watts would be required. As a safety factor, however, 900 watts of electrical heater capacity was supplied, in six units of 150 watts each. The heating elements are sheathed in brass to prevent moisture from coming in contact with the element wire, and the elements were located in two banks of three on each side wall of the refrigerated room.

The heat supplied by these heating elements, in consequence, passes



Here's a close-up of one of the air distribution units.

uniformly into the air stream, and is distributed equally throughout the entire area of the cooler. These heating units, which are supplied with 220 volt, 60 cycle current, are controlled by a Penn Switch heating thermostat, which is calibrated similar to the cooling thermostat.

Automatic Heat Feature

By adjusting this heating thermostat 2 degrees lower than the cooling thermostat, heating is supplied automatically in the cooler whenever the temperature drops below the normal cooling range.

Wherever possible throughout the installation, sweat type refrigerant fittings and hard copper tubing were employed, so that a minimum number of joints would exist where future leaks might occur. Flare connections were used on any points that might need removing for replacement or repairs at a later date.

A pilot light was installed outside of the refrigerated enclosure to indicate when the cooler lights are lit. After the installation was completed and turned over to the owner, simple instructions covering the care and maintenance of the equipment were supplied by the refrigeration contractor. The user was cautioned, in particular, not to disturb the refrigeration system in any manner other than required for normal maintenance. This would cover oiling and cleaning of the equipment, replacing of fuses, and overload resets.

For many years past, greenhouse and truck garden men have purchased semi-automatic equipment for maintaining controlled temperatures in their produce storages, or have operated entirely without refrigerated storage facilities. The installation at C. R. Perkins & Sons is an indication of the type of system that can be installed employing present-day refrigeration equipment and accessories.

In engineering an installation job of this kind, however, important consideration must be given to insure that the storage space decided upon is of ample size to take care of the peak production of the grower, and that the refrigeration and heating equipment chosen is adequate to handle the respective loads in the territory in which the installation is made.

Growers Need Refrigeration

Many growers need, and are anxious to purchase, equipment of this type, because of the obvious benefits which it makes possible for them, in protecting their produce from changes in weather conditions, and enabling them to harvest their produce when it is in best condition and hold it until the market is most favorable. Great savings can be made by growers who use refrigerated storage equipment; without it, they are unable to control the development of their products, and often experience considerable loss because of waste and spoilage, besides having to take additional losses when markets are over-supplied with flowers or vegetables of one kind or another.

Here is a relatively large market for refrigeration equipment; it is also a market which, by and large, is relatively unexploited. Installations of this type present no engineering or applications problems requiring specialized knowledge, so that they are wide open, as far as the average re-

Continued on page 44

DOES YOUR SERVICE DEPARTMENT HAVE A MANPOWER SHORTAGE?

YOU CAN TAKE SERVICE BUSINESS WITHOUT DOING THE REPAIR WORK

by using G-E Factory Service Plans

EVEN if a scarcity of skilled repairmen has interfered with your ability to service fractional-horsepower motors, here's a way to get your share of this increasing wartime business.

These G-E Plans enable you to repair or replace, *quickly, economically,* and *expertly,* practically any G-E fractional-horsepower motor which has become inoperative, regardless of the type or make of appliance on which it is used. And there's no need for you to train repairmen—G.E. does the work, *quickly* and *reasonably,* and you know your profit beforehand. You render the service without actually making the repairs.

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1. The Exchange Plan — Covers the most commonly used types of G-E fractional-horsepower motors. Makes possible immediate replacement, from G-E field stocks or from your own buffer stock. Replacement motors carry the G-E new-motor warranty, except for finish.

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3. Regular Repair Plan— Covers f-hp motors not included in either of the other two plans, except extremely old or obsolete models. Inspection is made at the factory, and a cost estimate is submitted before work is started. These motors also carry the G-E new-motor warranty, except for finish. This plan rounds out this G-E service and enables you to handle repairs on practically any G-E fractional-horsepower motor.

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Schenectady 5, New York

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MOTORS

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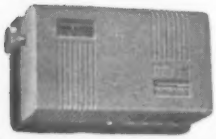


Honeywell provides the answer with the Polartron *System* of Automatic Defrosting Control. — Applicable to all "above freezing" fixtures the Polartron System provides for temperature "Cut-out" and Pressure "Cut-in" operation thus assuring positive defrosting at the end of each "on" cycle. Take advantage of the full capacity built into your refrigeration equipment — use the Polartron System. See your jobber for further details. Minneapolis-Honeywell Regulator Company 2909 Fourth Avenue South, Minneapolis 8, Minnesota. Branches and distributing offices in all principal cities.

MINNEAPOLIS
Honeywell
CONTROL SYSTEMS

The Polartron System of
FROST-FREE REFRIGERATION

PISTON PINS . . .

Continued from page 19

away and little bearing surface will result.

Fig 3 shows a reamer held in a tap wrench. This is the standard method of holding a reamer, but the results in piston pin holes are not good. Among the reasons are these: the length of the handles enables the operator to apply a great deal of power and to "hog" the work. Again, the power is applied high on the reamer, which makes tipping of the reamer almost certain. This causes bell-mouthing, which is illustrated by the cross section at Fig 4 and is very common in reamed holes.

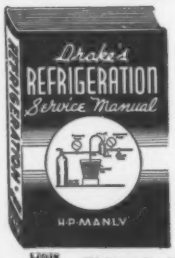
Further than this, if the operator stands in one place, as he usually does, power is always applied to the handles at the same point and stopped at the same point, since he must change hands. This results in an effect known as corrugating, illustrated at Fig. 5. Fig. 6 shows the reamer held in the vise, and the piston held by hand. The amount of power that can be applied is limited; the cut, therefore, must be light, and bell mouthing is almost impossible.

Fig. 7 shows the worst possible method of reaming, but a practice, alas, which is well nigh universal. The reamer is turned by an open end wrench. Bell mouthing and corrugations are practically unavoidable. The bearing surface might possibly reach as high as 10 per cent.

Try the pin in the hole after each pass of the reamer. If it enters the hole try tapping it into place with a four ounce hammer, up to a half inch pin. If the pin won't pass into the hole, it is because the hole is bell mouthed, and the inside surfaces will have to be cleaned up. It is best to fit a three thousandths oversize pin first, so that if you ream over that size you can still fit a five thousandths oversize pin. If, after the pin is in place, it squeals when the rod is oscillated, it is necessary to pass the reamer through the hole again, and remove another quarter thousandth of an inch.

If only a few sizes of pins are fitted, it might pay to buy or make hones or laps and remove the last quarter thousandth with the hone or lap. This

NEW '45 EDITION



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- Maintenance Men
- Dealers
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Only **$2.00** Written by H. P. Manly, refrigeration authority, this NEW book covers refrigeration problems in conversational language so that its 300 pages and 138 diagrams and illustrations can't miss being a real HELP TO YOU. Covers practically every operation in field service and shop operations which may be required. Includes domestic types of refrigeration, and fully and completely explains the commercial types in small and medium sizes, such as used in markets, milk depots, soda fountains, flower shops, etc., as well as in many air conditioning systems.

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NO

WE do not manufacture complete refrigeration units, such as . . . Frozen Food Cabinets, Farm Freezers, Ice Cream Cabinets, Milk Coolers, Bottle Coolers, Walk-In and Reach-In Refrigerators, etc.

BUT

WE do supply manufacturers of the above complete refrigeration units, and many others with Dole Vacuum Cold Plates.

We do not compete with our customers.

Dole smooth surface plates assure maximum refrigerating efficiency and lasting satisfaction.

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DOLE *Largest Manufacturers of Plate Type Evaporators*

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New York Branch: 103 Park Avenue, New York 17, N. Y.

will leave a smooth round hole, with a fairly large amount of bearing surface.

Use of Machines

In a busy shop, handling a great variety of work, a pin hole grinder or honing machine will soon pay for itself. There are several machines of this type, some are low in cost and simple in design, others are quite elaborate. The set up time is low, and the stones and mandrels have a reasonable long life.

In a pin hole grinder, means are provided to increase the size of the mandrel while it is turning, by pressing down on a pedal. The work is held in the hands, and a wide variety of work can be done. Cylinders up to 2" in diameter in pumps, motor bearings and hydraulic cylinders can be ground. Even hardened steel bushings or bearings can be handled.

In cast iron, about .002" can be removed in one minute. In any metal, even aluminum, the finish is excellent and the percentage of bearing surface is high, averaging as good or better than a new piston.

Due to the difference in bearing surface between a ground and a reamed hole, it is never necessary to use a fit tighter than a "thumb push fit". Even a pin which will fall through a ground hole of its own weight will not knock in a pump at speeds up to 750 r.p.m.

Since the methods of operating these machines vary widely, and since complete instructions are furnished by the manufacturers with each machine, there is no point in trying to cover these methods in this article. However, in no case is any specialized training required. The skill of the operator develops rapidly, as does his speed. Women operate them in many industrial plants.

The cost per hole is lower than reaming. In 1939, a pin hole grinder complete with mandrels, stones, etc., for holes from .365" to .850" cost about $200. It is not necessary to buy a complete set of mandrels, as they can be added as the need arises. No refrigerator shop having such a machine will ever have use for reamers, and in addition to the conventional work will be able to use this machine for a variety of purposes.

COLD FACTS BY ANSUL

IN PRE-WAR PARIS, FASHIONABLE CAFE'S FOUND THEY COULD SERVE FRESH FROG LEGS THE YEAR 'ROUND BY KEEPING FROGS ALIVE IN WINTER ON FLIES CAUGHT AND FROZEN IN SUMMER.

MODERN REFRIGERATION SUPPLIES MANY UNUSUAL NEEDS..AND SPEAKING OF SUPPLIES.... **ANSUL LIQUID SULFUR DIOXIDE — ANSUL LIQUID METHYL CHLORIDE** ARE IMMEDIATELY AVAILABLE.

Our technical book, "Ansul Refrigerants" (3rd Edition) available upon request

ANSUL CHEMICAL COMPANY, MARINETTE, WIS.

"Now in our 30th year"

AGENTS FOR KINETIC'S "FREON-11," "FREON-12" AND FREON-22"

LEHIGH LEASES M & E FACILITIES

Lehigh Foundries, Inc., Easton, Pa. has taken over the Merchant & Evans Co. Lancaster plant war production operation and its regular commercial refrigeration manufacturing business on a long-term lease of facilities, and will conduct the business as the M & E Refrigeration Division of Lehigh Foundries.

The company will market commercial high side equipment from ¼ to 5 H. P. as soon as conditions permit, and plans an extension of marketing outlets. Thomas Evans, M & E president, will continue as refrigeration consultant to Frank E. Shumann, Lehigh president, and M. P. Stoney, M & E engineering vice president, will act as refrigeration advisor. Jack Miller, formerly with White-Rodgers, will be sales manager.

ALCO "E" RENEWED

Alco Valve Co., St. Louis, has been granted a second renewal of the Army-Navy "E" Award for meritorious service on the production front.

*Anaconda Cup Seal**

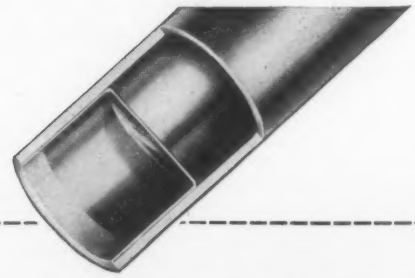
brings you 4 EXTRA BENEFITS . . .

1. *Clean, Bright, Dehydrated Interior* maintained by soldered cup seal.

2. *Waste Minimized* because end cut off is no longer than diameter of tube.

3. *No Sharp Edges* at the end of tube to dent or mar the coil.

4. *Easily Fed* through smaller openings than is possible with crimped or flattened ends.



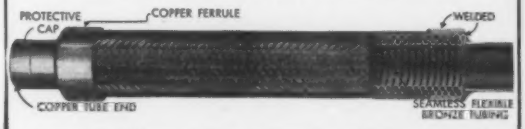
NEXT TIME you order copper refrigeration tubes, ask for *Anaconda.* Processes used in their manufacture include every procedure which can give you a more dependable, easy-to-use, trouble-free tube. Made of 99.9% pure copper, deoxidized to increase corrosion resistance, thoroughly and uniformly annealed throughout their entire length, Anaconda Refrigeration Tubes are easy to bend, and readily flared without cracking.

Anaconda Dehydrated Copper Refrigeration Tubes are available in all standard sizes up to and including ¾" O.D. and are usually stocked by distributors in coils of 25, 50 and 100 feet. Longer lengths are available on special order. They are manufactured in accordance with A.S.T.M. Specification B68-43.

*Patent Applied For

BUY WAR BONDS—Saved dollars mean saved lives

AMERICAN VIBRATION ELIMINATORS



American Vibration Eliminators exclude vibration and compensate for thermal expansion in pipe systems.

Pressure-tight, safe for conveying costly gases or liquids, such as refrigerants, American Vibration Eliminators are easily installed. For catalogue, write American Metal Hose Branch, Waterbury 88, Connecticut.

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THERMOBANK

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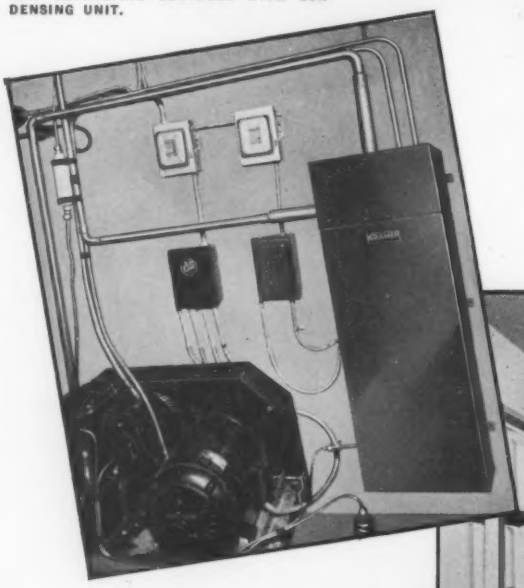
KRAMER

INSTALLATION SHOWING THERMOBANK AND DEFROSTING CONTROLS WITH CONDENSING UNIT.



With the Thermobank a low temperature system is just as automatic as a 40° system.

NO ELECTRIC HEATERS
NO BRINE SPRAY
NO WATER SPRAY

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Bulletin T-V-345-RI-3

THERMOBANK EVAPORATOR INSTALLATION IN MINUS 20° F. ICE CREAM HARDENING ROOM.

KRAMER TRENTON COMPANY

Trenton, New Jersey

DOOR TO SALES . . .

Continued from page 25

to route men so that as much work as possible is done in one neighborhood, with men calling in from one job for instructions before going to the next, unless their route has been developed when they leave the shop in the morning. It is generally not possible to make regular times for servicing special parts of the city on certain days, because breakdowns occur which require immediate repair.

As much as possible, workers are given special work for which experience fits them. For instance, a soda fountain man is employed who specializes in these repairs.

"Samples" in the Windows

In the large street floor rooms, refrigeration units show the scope of the maintenance work the company does. Windows which front the building are used for display and for posters which present the work of the company. Offices are on the balcony which extends along one side of the large main room, back of which are the work rooms, in addition to the complete machine shop on the second floor of the building.

"I was never content to stand still," Mr. Colestock says. "If I thought that we had developed as much as possible, I'd move out tomorrow. But I feel that we are just at the beginning of a business which offers wide fields of expansion. The refrigeration field of tomorrow, with the necessity for installations and maintenance in addition to sales, is one that we look forward to with interest and confidence. Our plans for a greatly expanded business are already made."

JUST OUT! NEW FROM COVER TO COVER • 1280 PAGES • FULLY ILLUSTRATED

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Employed by.....

Continued from page 17

some consideration. One of the initial studies will have to do with profit possibilities in frozen food sales.

Headquarters will be in Syracuse, N. Y., and Gerald A. Fitzgerald, formerly with Richardson & Robbins, Dover, Del. and General Foods Corp., will be director. The Institute will not design or manufacture frozen food cabinets.

• COOLER PRICING

Manufacturers of evaporative coolers are eligible for individual price increases if they fulfill the requirements under which such increases may be granted, OPA reports.

In the same action, OPA made it clear that evaporative coolers are included under household air conditioning equipment and are covered by the general consumers durable goods regulation, Maximum Price Regulation No. 188.

• POSTWAR PROMISE

DISTRIBUTORS and dealers who are worrying about what they'll get, if anything, for "holding the fort" for manufacturers in the lean years of very little new civilian goods or no new goods at all, can find promise in advice issued to top industrial men by William E. Holler, General Motors executive.

Big business will get big dividends, Mr. Holler said, through standing by the men who have stood by them in cities throughout the country. Despite a rush for dealerships by newcomers, the old distributors and dealers, who have been giving service to owners and users, have sustained the manufacturers' reputation through the lean years, he said.

And manufacturers need the dealers who have been building up the producer's reputation for the long pull, while the factories have been building war products.

• FREON CONTROLS OFF

ALL CONTROLS on production and distribution of Freon-12 and Freon-22 were removed by WPB in revoking Orders M-28 and M-28a. WPB warned, however, that prompt return of empty cylinders is essential, otherwise shipments of the refrigerants may be seriously affected.

• SPOT BAN LIFTED

WPB HAS LIFTED the ban on spot authorizations in Group I and II labor areas. Spot authorizations may now be granted in all areas on the same basis, lifting the ban on those two tight labor areas and returning the plan to full operation.

Deferred allotment procedure will not make additional steel, copper and aluminum available at once, but idle and excess inventories may now be used. This may help industry some as a starter, but with open-ending of CMP the "spot" plan will not be as important to reconversion as it once seemed.

To help small companies get materials, WPB has issued PR 27, extending an AA-4 rating and Z-1 symbol to firms producing under $50,000 worth of goods a quarter.

AMINCO
OIL SEPARATORS

Aminco Oil Separators protect compressors by maintaining correct oil level in crankcase and by excluding oil from refrigerant stream they enable coils, condensers, valves and dehydrators to function most efficiently.

These oil separators are made for jobs from ½ H.P. to 120 tons and are used everywhere, ashore or afloat, where efficient refrigeration is desired.

Full descriptive bulletins on request.

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HOME FREEZERS

THE COMPLETE LINE

With Amana you are READY to cash in on a GREAT NEW APPLIANCE MARKET. The three modern AMANA FREEZERS fit the needs and pocketbooks of ALL USERS. GET FACTS on AMANA. It's a good name to be associated with. Write or wire.

Refrigeration Division
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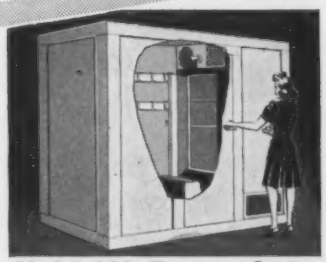
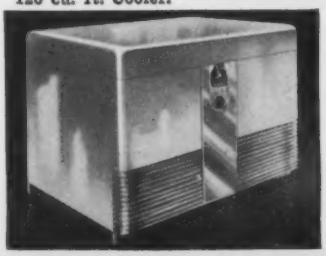


Model 200 Freezer - Cooler
A complete private Locker Plant. 23 cu. ft. sharp freezing capacity. 120 cu. ft. Cooler.

Model 50
5 CU. FT. CABINET. Accessible . . convenient . . counter - balanced lid. No waste space.

Model 90
9 CU. FT. CABINET. Full view counterbalanced top. Contents easily accessible. 100% usability of storage space.



Precision
Only precision parts go into
the construction of
Mills Air and Water Cooled
Condensing Units.
Mills Industries, Incorporated,
4100 Fullerton Ave., Chicago 39, Ill.

A NEW FIELD . . .
Continued from page 34

frigeration contractor is concerned. Individual conditions, naturally, must be dealt with in each application, but these are seldom of such character as to pose problems beyond that of any other commercial refrigeration installation.

In communities of all except the smallest size, there are growers whose operations are of sufficient size to make well worth while the installation of refrigerated storage equipment. Refrigeration contractors on the alert for new sales and profit opportunities will survey the possibilities in their own territories, and begin to get their share of jobs to be had in this new and widening field.

NEW OFFICERS NAMED BY FEDDERS MFG. CO.

Salvatore Giordano, president of Frank J. Quigan, Inc., Maspeth, L. I., has been elected president of Fedder Mfg. Co. to succeed president T. C. Fedders. New interests headed by Mr. Quigan have elected a new board of directors and reorganized the executive staff.

Mr. Quigan was elected chairman of the board and treasurer. Edmund R. Walker, who has been general manager of Fedders, was named vice president and director; Milton C. Wiseman, New York attorney, was named secretary, and Elizabeth J. Lay, treasurer of Frank J. Quigan, assistant secretary. W. C. Winkler continues as comptroller.

Warren E. Detenbeck, formerly executive vice president and secretary, is leaving the company. Mr. Fedders was elected a director.

NEW THERMAL BRANCHES

Thermal Co., Inc., refrigeration supplies jobber with headquarters in St. Paul, has opened new branches in Cedar Rapids, Iowa, and Great Falls, Mont. In Cedar Rapids, the company purchased the entire stock of Janda Refrigeration Supply, and is located at 503 4th Ave S. E., with Cal H. Moser, formerly with Janda, as branch manager.

The Great Falls branch, located at 306 1st Ave. S., is managed by Al D. Forbes, formerly with Starter & Battery, Inc., of that city.

Will it have a handsome modern Dial Thermometer?

● If you are planning refrigeration equipment, particularly the "cold box" type, the Marsh organization is in an excellent position to produce dial thermometers that will grace your equipment—thermometers as accurate as they are attractive. Yet, thanks to modern production methods, we can supply them in quantities at a cost that you can justify in a highly competitive market.

If your present plans do not call for a thermometer, consider this sales building feature in the light of competition that is bound to come. An attractive dial thermometer is the costume jewelry of the refrigerating unit—and proof that the unit is doing its job right.

The thermometer illustrated is the Bi-metallic type, but special types and dials are available in quantity orders. No matter how unusual your design, Marsh engineers are ready to help you incorporate a thermometer that will add another effective talking point to your cold box. Write for further information today.

JAS. P. MARSH CORP., 2060 Southport Ave., Chicago 14, Illinois
Export Department: 155 East 44th St., New York 17, N. Y.

MARSH *Refrigeration Instruments*

Why the Trend Is Strong to CHICAGO SEALS and VALVE PLATES

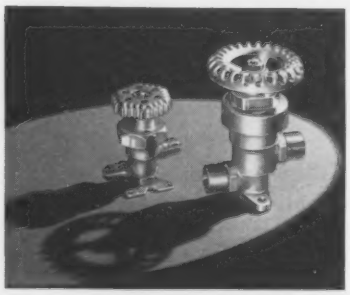
Chicago Seals and Valve Plates make a better servicing job on all refrigerators, in less time, at less cost, at more profit . . . and more service men and more jobbers are finding out this fact every day.

CHICAGO SEAL CO.
20 North Wacker Drive, Chicago 6, Ill.

here is another peacetime development where

PRECISION ENGINEERED **KEROTEST** VALVES

—will play an important part!



Self-Service retailing of meats and delicatessen items is a sound and proven merchandising method. Consumers like the idea because it saves time, offers a wider choice of varieties, ready-packed and ready-priced. Operators like the idea because it saves labor, provides faster turnover, larger sales, less spoilage.

Another instance where the dependability and pioneering of Kerotest *advanced-engineering* in the Air Conditioning and Refrigeration industry will play an important role.

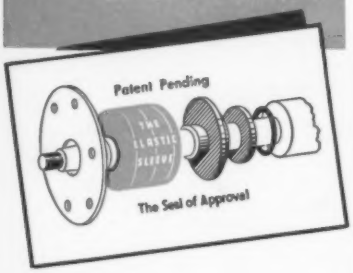
KEROTEST

KEROTEST MANUFACTURING COMPANY

Pittsburgh, Pennsylvania

ORIGINATORS OF THE PACKLESS DIAPHRAGM VALVE

WRITE
FOR FULL PARTICULARS
ON THIS Sensational
New ELASTIC SLEEVE



- New Design
- New Materials
- New Performance

The ELASTIC SLEEVE is an entirely new principle in a seal for all types of rotary shafts. An entirely new material has been used for oil resistant elasticity in place of springs.

The ELASTIC SLEEVE works equally well on worn and pitted shafts—is easy to install as a replacement seal—has fewer working parts—features the sensational "O" ring between the shaft end and the worn shaft.

If your jobber is not equipped to supply you, order directly from . . .

TEMPERATURE Control Devices

NEW HAVEN 15, CONNECTICUT

Marion E. Miller, who organized and directed the huge production program of the Philadelphia Ordnance District, Army Service Forces, has been made president of Electric Power Equipment Corp. of Philadelphia.

Mr. Miller

The company's entire South Philadelphia plant, now producing bombs, grenades and rockets, will be devoted exclusively to commercial refrigeration products, including condensing units and unit coolers. Plans are being completed now for the rounding out of a distributing organization.

Associated with Mr. Miller is **R. H. Shanaman,** secretary-treasurer; **William E. Ural,** chief refrigeration engineer; manufacturing will be directed by **H. C. Mitchell,** formerly of Talon Inc.; **R. G. Regester,** former sales promotion manager for the Gill Glass Co., handles advertising.

J. A. Vassar, formerly assistant service manager of the Westinghouse electric appliance department, has been appointed general service manager of Westinghouse Electric Supply Co., with headquarters in New York City.

Glenn L. Pringey, manager of Lighthouse, Inc., Cleveland commercial refrigeration dealership, died May 10 after a brief illness. A veteran refrigeration man, Mr. Pringey was active in affairs of Cleveland section of A.S.R.E. and Refrigeration Service Council of Cleveland.

Thomas F. Joyce, formerly general manager of the radio, television and phonograph department of RCA Victor, has resigned to become general manager of Raymond Rosen & Co., Philadelphia Kelvinator-Leonard distributor, in which he has acquired part interest.

In organizational changes coincident with Superior Valve & Fittings Co.'s seventh anniversary, **K. M. Newcum,** vice president, has assumed charge of engineering, development and quality control, and **W. A. Siegfried** has been named sales manager, responsible for sales policies and advertising. Previously, Mr. Newcum had been vice president in charge of sales, and Mr. Siegfried his assistant.

S. R. Sellers, H. C. Patterson, and **C. J. Bachman** have been named managers of the eastern, western and Pacific regions, respectively, for Kelvinator, according to announcement by Charles T. Lawson, vice president in charge of sales, Postwar sales policies of the company, Mr. Lawson said, will remain basically unchanged.

Mr. Emde

Mr. Lesley

The board of directors of Temprite Products Corp. has announced the addition of one new member and the promotion of another within its executive ranks.

Lud Emde, for 15 years with Worthington Pump and Machinery Corp. and Detroit district manager of that company since 1938, becomes vice president, general manager and a director of Temprite, succeeding the late John Wyllie, Jr., and **P. Fred Lesley,** a board member and secretary and treasurer of the company, becomes assistant general manager in direct charge of production, purchasing and finance.

Continued on page 48

Bonney
PRECISION
Open
End Wrenches
BONNEY
BONNEY
There's a big difference in open-end wrenches. And mechanics who have been working with Bonney Wrenches for years know how big that difference really is. You don't need space above the nut with these open-end wrenches. And their pear-shaped heads let you turn further in tight places. Easier to use. Get the job done faster. They're custom-hardened, too. And precision milled. That's why they do such a good job for such a long, long time. For further information on Bonney Tools, see your nearest Bonney Jobber or Distributor.
BONNEY TOOLS
BONNEY FORGE & TOOL WORKS
719 N. MEADOW ST., ALLENTOWN, PA.
In Canada: Gray-Bonney Tool Company, Ltd., St. Clarens & Royce Aves., Toronto
BUY MORE WAR BONDS AND KEEP THEM

● Aerovox is still the pioneer—with a simple and profitable solution of the wartime servicing problem. You can now service those worn-out motor-starting capacitors and keep old refrigerators running with Aerovox universal replacements.

Only 28 universal numbers—22 for 110-volt, 6 for 220-volt—take care of upwards of 90% of all motor-starting replacements. Handy Aerovox conversion chart indicates proper universal type for any previously available type. Minimum stock; maximum service.

Ask Your Jobber . . .

● Ask for Aerovox motor-starting capacitor replacements. Ask to see the Aerovox conversion chart. Or write us direct.

AEROVOX Capacitors
INDIVIDUALLY TESTED
AEROVOX CORP., NEW BEDFORD, MASS., U. S. A.
In Canada: AEROVOX CANADA LTD., HAMILTON, ONT.
Export: 13 E. 40 St., New York 16, N.Y. · Cable: 'ARLAB'

ABOUT PEOPLE . . .

Continued from page 46

L. H. (Larry) Fischer has been appointed Cincinnati district engineer for Vilter Mfg. Co. His territory will include the southern half of Ohio, the state of Kentucky and parts of West Virginia and Indiana. Mr. Fischer has been connected with the refrigeration and air conditioning industry in various sales and engineering capacities since 1925.

Charles R. Logan has resigned as eastern district manager of Superior Valve & Fittings Co., effective May 15. His future plans are as yet unannounced.

William G. Hills has been appointed managing director of the Electric Institute of Washington (D. C.). He had been acting in that capacity since the recent resignation of J. S. Bartlett, who left to become assistant commercial manager of Potomac Electric Power Co. Mr. Hills has been assistant managing director of the Institute since September, 1944. Coincident with Mr. Hills' appointment, Mr. Bartlett was elected to the Institute's board of directors.

J. G. Harris, who has been with Frigidaire in various capacities for the past 20 years, has been named commercial sales manager of the Pittsburgh branch.

Henry J. Lange has been named plant superintendent of the Betz Corp., Hammond, Ind.

Leroy F. Keely has been appointed general sales manager of Howell Electric Motor Co., Howell, Mich.

Changes in branch personnel involving **Ben S. Wright, W. H. Atkinson,** and **Frank L. Myers** have been announced by Owens-Corning Fiberglas Corp. Mr. Wright has been named manager of the Cleveland branch, 825 Hanna Bldg.; Mr. Atkinson will manage the Chicago branch, 3206 Pure Oil Bldg.; Mr. Myers will return to the factory at Toledo to join the general sales organization.

Wm. D. Graham has been named manager of the Greensboro, N. C., branch office of the Trane Co. The office, located at 504 Jefferson Standard Bldg., will serve the greater part of the North Carolina territory.

Frank G. Purcell, formerly with Frigidaire, has joined Tecumseh Products Co. as service manager.

Elizabeth Woody has been appointed director of the General Electric Consumers Institute. Miss Woody was director of foods for McCalls magazine from 1935 to 1944 and previously had long experience as an advertising copy writer and director of daytime radio programs.

Dr. Donald K. Tressler will continue as consultant to General Electric on special problems in connection with food technology.

C. S. Trigg and **Paul J. Barnaby** have been appointed to key positions in Frigidaire's sales promotion department. Mr. Trigg, formerly in charge of appliance training, is now manager of appliance product promotion, and Mr. Barnaby, formerly of the commercial training department, is manager of the commercial product promotion.

Mr. Trigg

Mr. Barnaby

Richard K. Law has resigned as director of advertising and public relations for American Hospital Supply Corp., Chicago, to become advertising manager of Mills Industries, Inc., Chicago.

R. S. Paltz has been appointed advertising manager of Detroit Lubricator Co. to succeed W. H. Hohmeyer, who becomes manager of the company's oil burner controls division. Mr. Paltz has been connected with the advertising department for several years.

SAN FRANCISCO JOBBERS HEAR ABOUT P-126

Sterling Smith, of Mills Industries, Inc., Chicago, spoke on P-126 changes at a recent meeting of San Francisco refrigeration jobbers. Other guests were Harold Stern, Refrigerative Supply, Seattle, and L. P. Roth, Refrigeration Service, Los Angeles. Here are (lower row): Wyatt Brown, Wyatt Brown Co.; A. F. Tudry, Refrigeration & Power Specialty Co.; Mr. Stern; F. H. McLaughlin, Refrigeration & Power Specialty; Jess E. Rauch, and Clarence F. (Sandy) Pratt, California Refrigerator Co. (Upper row): Robert Hinshaw, Hinshaw Supply Co.; N. W. Edwards, Refrigeration & Power Specialty; Lem V. Branson, California Refrigerator Co.; Byron Waters, Pacific Metals Co.; and Mr. Smith. (Photo by L. P. Roth, Refrigeration Service, Inc., Los Angeles.)

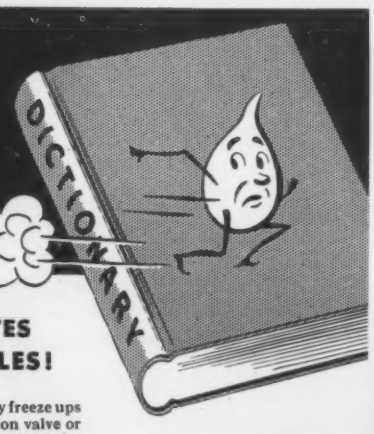
VOTE CHANGE IN NAME

Stockholders of Westinghouse Electric & Mfg. Co. voted at their recent annual meeting to change the company's name to Westinghouse Electric Corp., for simplicity and brevity, and also to split the company's stock on the basis of four shares for one. Purpose of the stock split is to broaden base of Westinghouse ownership by making stock available at a lower price.

OPENS IN SHREVEPORT

Standard Brass & Mfg. Co., refrigeration supplies jobber with headquarters in Beaumont, Tex., has opened a branch at 901 Hope St., Shreveport, La.

ICE-X
MEANS
"EXIT ICE"



COMPLETELY ELIMINATES MOISTURE TROUBLES!

ICE-X quickly cures emergency freeze ups when ice forms at the expansion valve or capillary tube. Harmless to use. Great for Freon, Carrene, or Methyl Chloride systems...The dependable liquid anti-freeze.

ORDER FROM YOUR JOBBER OR—

ONE SERVICE MAN TELLS ANOTHER "IT'S GREAT"

EXCLUSIVE NATIONAL DISTRIBUTOR
THE HARRY ALTER CO. 1728 S. MICHIGAN AVE. CHICAGO 16, ILLINOIS
JOBBERS: WRITE FOR SPECIAL PROPOSITION!

Proven Pittsberg Products

SULPHUR DIOXIDE

METHYL CHLORIDE

METHYLENE CHLORIDE

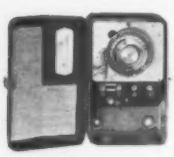
Proven for uniformity, and low moisture content

Your inquiries on other chemicals are invited

PITTSBERG CHEMICAL CO.
3100 East 26th St., Los Angeles 23, Cal.
SALES AGENTS FOR:
KINETIC CHEMICALS
FREON 11—FREON 12
FREON 22

Mr. Tops, the Paragon symbol of top quality

Automatic time controls are speeding production . . . multiplying manpower efficiency . . . and saving countless hours in thousands of plants in scores of industries. Submit your timing problem to Paragon . . . your top source of time controls.



300 Series

800 Series

700 Series

2500 Series

ONLY $13.00 LIST—300 Series self-lubricating time switches are accurate and durable for controlling stokers, oil burners, blowers, pumps, valves, air conditioning, etc. America's leading time switch value.

TIME DELAY RELAYS—The time cycle of Paragon synchronous motor operated, instantaneous reset type relays is unaffected by vibration or changes in ambient temperature. For motor and tube protection.

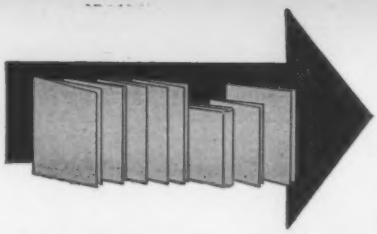
7-DAY TIME SWITCHES— . . . are designed for presetting heating or ventilating schedules on a weekly basis with independent daily operations.

MANUALLY PRESET TIMERS — The 2500 series is designed to close or open a circuit at the end of a preset interval, such as attic fan control.

All these units are designed and built by Paragon . . . a pioneer in the automatic timing field. Send for complete bulletin.

PARAGON ELECTRIC COMPANY
735 OLD COLONY BUILDING
CHICAGO 5, ILLINOIS

Paragon Chicago
BUILDERS OF ELECTRICAL EQUIPMENT . . . SINCE 1905



Useful Literature

The publications featured on this page were written by experts. They are FREE publications. To obtain these write to THE REFRIGERATION INDUSTRY, 812 Huron Road, Cleveland, 15, Ohio. If there is some delay in receiving the material requested, please understand that this is due to our operating with a minimum staff. We shall put through all requests as rapidly as possible.

160—Lubrication Guide . . . A specially prepared guide listing correct grade of oil for each of 55 electric refrigeration units and 32 air conditioning units. Also shows make and type of compressors and refrigerants used in these units. Issued by The Texas Co.

161—Pipe Joint Compound . . . Folder illustrating use and describing features of its Pipetite-Stik pipe joint sealer-compound issued by the Lake Chemical Company.

162—Condensed Catalog . . . Catalog issued by B. F. Sturtevant Co. entitled "What We Make." Lists equipment for ventilation, humidifiers and dehumidification air conditioning units, cooling coils, etc. Includes sections on applications and data on air handling.

163—Brochure . . . Issued by Wisconsin Screw Co. to tell a photographic story of its plant and personnel facilities. Of interest to manufacturers only.

164—Service Help . . . First of a series of service bulletins offered by Detroit Lubricator Co. on refrigeration service problems and their solutions. Current bulletin is on moisture. Printed on 8½ x 11 paper, punched for standard loose-leaf binder.

165—Compressor Seals . . . Descriptive literature on the compressor seal developed by Temperature Control Devices, incorporating the "elastic sleeve" principle, said to work equally well on worn, bent, slotted or pitted shafts.

166—Ice Cream Cabinets . . . a new 88-page service manual on ice cream cabinets and condensing units, issued by Liquid Carbonic Corp. Contains illustrations and diagrams explaining mechanics, with detailed installation and servicing instructions. Available to service men and users.

167—Reach-In Refrigerators . . . Information on the "Rogers" line of all-porcelain and baked enamel reach-in units, issued by Modern Appliance Co. Lists specifications, sizes, features.

168—Gaskets . . . A booklet on Flexitallic gaskets, issued by Flexitallic Gasket Co. Lists construction features, detailed data on various styles of units, dimension data, temperature-pressure relationships, wall thicknesses of welded and seamless steel pipe, and other data.

169—Welding Data . . . Information on the applications and advantages of Aladdin welding rod in welding and brazing operations on aluminum and other white metal. Available from Aladdin Rod & Flux Mfg. Co.

170—Compressor Information . . . Five bulletins on Worthington refrigeration compressors, direct connected or V-belt drive. Issued by Worthington Pump & Machinery Corp. Lists specifications, and illustrates and describes cardinal features.

171—Portable Welder . . . Information on the portable welder manufactured by Super Welder Mfg. Co., useful for light welding and brazing operations in refrigeration repair shops.

MAIL THIS COUPON FOR FREE LITERATURE

Refrigeration Industry, 812 Huron Road, Cleveland 15, O.

I should like a copy of the literature listed below:

NO.	NO.	NO.	NO.
NO.	NO.	NO.	NO.
NO.	NO.	NO.	NO.
NO.	NO.	NO.	NO.

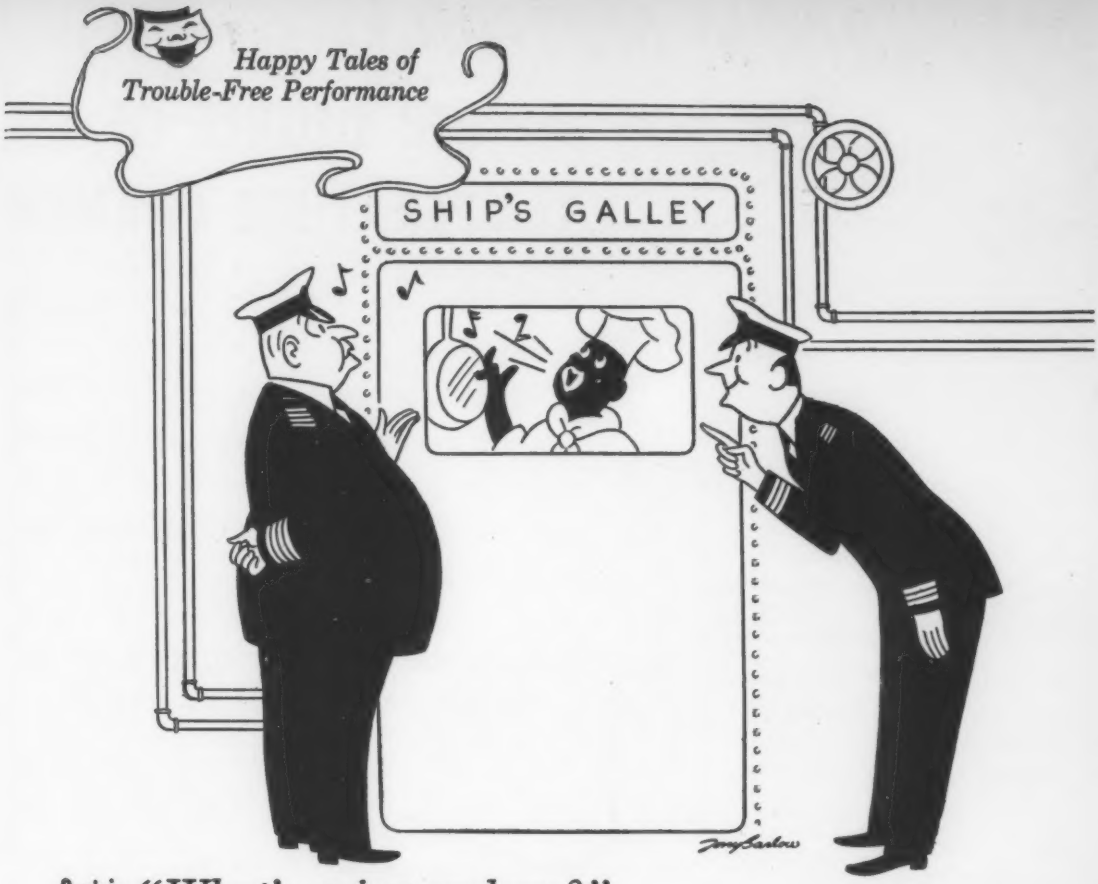
NAME _____ POSITION _____

FIRM _____

MAILING ADDRESS _____ ☐ HOME ☐ BUSINESS

CITY _____ ZONE _____ STATE _____

6-45



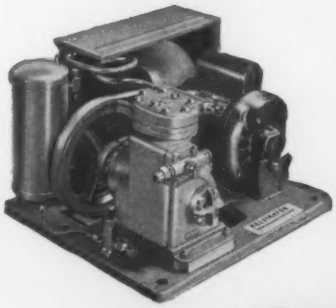
Captain: *"What's going on here?"*

1st Mate: *"Alamo's been bubbling ever since we equipped the galley with that new Kelvinator Condensing Unit!"*

Superior design . . . superior engineering are the reasons why Kelvinator Condensing Units for 30 years have meant *more* performance, *more* dependability, *more* economy.

That's why, when specifying condensing units, progressive service men always say *"Kelvinator"!*

Kelvinator distributors and zone offices stock a complete line of refrigeration supplies.



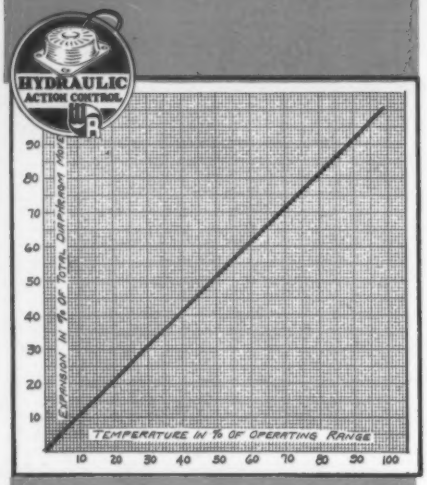
Kelvinator

DIVISION OF NASH-KELVINATOR CORPORATION, DETROIT

CONDENSING UNITS
SEALED · OPEN

FOR YOUR HOME—REMEMBER KELVINATOR REFRIGERATORS, ELECTRIC RANGES, WATER HEATERS AND HOME FREEZERS

DIAPHRAGM MOTION UNIFORM



★ PER DEGREE OF TEMPERATURE CHANGE

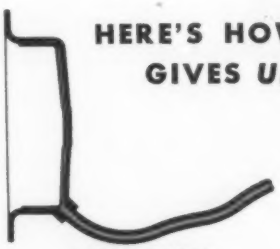
Notice, in the diagram at the left, how the expansion of the Hydraulic-Action diaphragm actually draws a straight line across the chart. This is because the force exerted by expansion or contraction under heat or cold is always *uniform*, and always predictable. That's another reason why White-Rodgers controls are easier to install and free of trouble.

8 EXCLUSIVE FEATURES OF WHITE-RODGERS HYDRAULIC-ACTION TEMPERATURE CONTROLS

1. May be mounted at any angle or position, above, below or on level with control point.
2. Hydraulic-Action principle incorporating solid-liquid-filled bulb and capillary provides expansion force comparable to that of a metal bar.
3. ★ Diaphragm motion uniform per degree of temperature change.
4. Power of solid-liquid charge permits unusually sturdy switch construction resulting in positive contact closure.
5. Heavier, longer-wearing parts are possible because of unlimited power.
6. Dials are evenly and accurately calibrated over their entire range because of straight-line expansion.
7. Controls with remote bulb and capillary are not sensitive to change in room temperature. Accuracy of control is not affected by temperature changes in surrounding area.
8. Not affected by atmospheric pressure. Works accurately at sea level or in the stratosphere without compensation or adjustment.

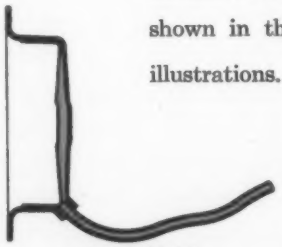
HERE'S HOW HYDRAULIC-ACTION GIVES *UNIFORM* EXPANSION

The solid-liquid charge of Hydraulic-Action provides uniform expansion and *uniform* motion of the diaphragm, as shown in the accompanying illustrations.



CONTRACTED

Above is a cross section of the diaphragm and part of the liquid-filled capillary. In this view the liquid has contracted, releasing the pressure on the diaphragm and causing the switch contacts to function.



EXPANDED

In this cross-sectional view, the liquid charge of the capillary has expanded with a rise in temperature. The positive force of this hydraulic action forces the diaphragm outward and causes the switch contacts to function.

Actual-size illustration of the White-Rodgers diaphragm body, the actuating element of every White-Rodgers temperature control. It is so designed as to exert full pressure at the point of contact with the switch mechanism.

WHITE-RODGERS ELECTRIC CO.

1225F CASS AVENUE ST. LOUIS 6, MISSOURI

Controls for Refrigeration • Heating • Air-Conditioning

The MARKET Place

RATES: minimum, 25 words, $2.00; each additional word, 10c. Bold type or all capitals: minimum, 25 words, $3.00, additional words, 15c. All insertions payable in advance.

"I WANT A JOB"

EX-ARMY SERGEANT, veteran of Pacific area, recent graduate of correspondence training school; also 300 hours experience in vocational high school "shop"; 10 months spare-time work on household, commercial systems. Army experience: fabricating, assembly, servicing of aircraft, heavy machinery; arc welding, gas welding, cutting. 28 years old, married, 1 child. Physically o.k. for all but heavy lifting. Prefer Buffalo, N. Y. area, but will consider elsewhere. Box 561-A, Refrigeration Industry.

HELP WANTED

Our Refrigeration Service Men earn $5,000—$7,500 annually. Nationally recognized as foremost refrigeration service and installation organization in the country. Sixteen years in service business—Chicago and Detroit. Permanent positions to capable service men. Executive advancement possibilities in post war expansion program. Refrigeration Maintenance Corp., 321 E. Grand Ave., Chicago.

Refrigeration Designer & Engineer

We are entering the manufacture of food freeze refrigeration units and require the services of an engineer to develop and design our line. The man we want must have several years of engineering experience with a refrigeration manufacturer, and must have been successful.

If you want to join an alert organization, made up of young executives who are going places, tell us about your experience, listing the names of your last three employers, showing job held, when you commenced with and left the firm, and other information that will help in determining your fitness for the job. We will not correspond with your present employer unless you request, but we will make a careful investigation. If we decide to interview you for the job, your expenses to our plant will be paid.

GENERAL MANUFACTURING CO.
4204 Lyndale Avenue North
Minneapolis, Minnesota

SITUATION WANTED

Expert domestic refrigeration Mechanic wishes to contact well known commercial and air conditioning servicing company for a position. A. Merold, 2364 Valentine Ave., Bronx, N. Y.

FOR SALE

Business opportunity; Refrigeration and Electrical business for sale; Not much capital required. Established 20 years, retiring from business. Box 6145.

"Offer for sale one (1) used twelve ton Voss Ice Machine, will sacrifice. Write to us for further details." E. Greenebaum Co., 328 East 103rd St., New York City.

FOR SALE—188 Used Somers Air Conditioning System Filters 20" x 20". These are in good serviceable condition. If interested write Mr. H. E. Warren, Manager Purchases and Stores, Gulf, Mobile & Ohio Railroad Company, P.O. Box 881, Mobile 5, Alabama.

Prefabricated sectional new metal walk-in storage coolers, all sizes. 10 gal. water coolers. New bottle coolers. Ice makers. Frosted Food cabinets. Water and air cooled condensing units. Write for list and prices. EDISON COOLING CORP., 310 E. 149th St., New York, 51, N. Y.

EUREKA-WILLIAMS MERGER

Merger of Eureka Vacuum Cleaner Co., Detroit, and Williams Oil-O-Matic Heating Corp., Bloomington, Ill., was to be voted on by stockholders at a meeting May 28. Williams makes the Ice-O-Matic line of condensing units.

NEW SCHAEFER AGENCY

Schaefer, Inc., Minneapolis, manufacturer of low temperature cabinets, has appointed McCann-Erickson, Inc., Minneapolis, to handle its advertising and public relations.

About Returning Empty Cylinders

-as Uncle Sam might say it...

"They call me 'Uncle' Sam. But, I am not an Uncle at all. I am you. I am *every* American. That makes my problem your problem — and your problem mine. Listen:

"War creates new problems which cannot be solved without cooperation. Here's one: Refrigerant manufacturers have been urged to deliver increased quantities of refrigerants. To do the job, they need thousands of additional steel cylinders. But, steel is vital to our boys in stopping the enemy!

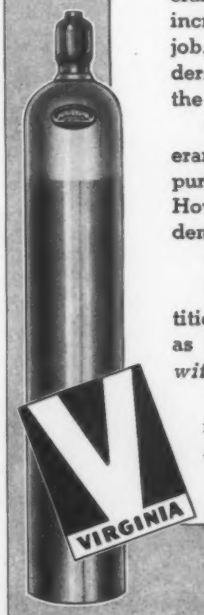
"Because our fighting men come first, refrigerant manufacturers have been permitted to purchase only a limited number of new cylinders. How, then, can they supply the heavy summer demand for vitally needed refrigerants?

"Brother, that's where you come in!

"Here's how: First, buy refrigerants in quantities you can use within 30 to 60 days. Second, as soon as containers are emptied *return them without delay to the refrigerant manufacturer.*

"See what I mean? We've got to keep existing cylinders at work all the time! You are an American — and I'm counting on you.

"Let's do the job!"



VIRGINIA Smelting Co.
WEST NORFOLK, VA.
76 BEAVER STREET, NEW YORK 5 :-: 131 STATE STREET, BOSTON 4
Agents for Kinetic's "Freon-12" — "Freon-22" — "Freon-11"

3-way Protection

...at lower cost

with CESCO'S No. 605 FUME KIT

CESCO'S Healthguard Fume Kit (No. 605) offers triple protection to refrigeration servicemen. Quick-change filter cartridges provide safety against ammonia, methyl-chloride and sulphur-dioxide fumes . . . all in one convenient kit. The soft molded rubber face-piece of the fume mask, and the instantly adjustable headgear assure a gastight, comfortable fit for every wearer. Large hardened safety glass lenses give perfect visibility.

The CESCO Healthguard Kit provides economical protection because it is moderately priced.

For full information, write for CESCO'S No. 605 Bulletin TODAY.

CESCO

CHICAGO EYE SHIELD CO.
2340 Warren Boulevard
Chicago 12, Illinois

CESCO FOR SAFETY

Over the COUNTER

BILL: Say, Jim, I just ran onto a real dandy. You know that old ½ H.P. compressor and brine coil installation at Harry's Meat Market over on Central Ave.—well, his machine ran dry and threw a rod last night. I went over to take a look at it and found the low side was also pretty badly corroded, so it looks like I'm goin' to have several days' work on that job and make myself a nice piece of change. I figure I ought to clear about $50 for the two days' work repairing that system.

JIM: **Not bad—but *I know a way you can make $150 clear* for about a day's labor.**

BILL: What do you mean—that I'm not chargin' enough for the job?

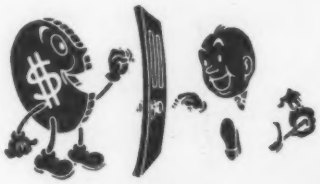
JIM: **No, it's like this: You say that Harry's compressor is 10 or 15 years old and has a brine low side. How long do you think that job'll hold together after you've repaired it?**

BILL: Oh—it'll see him through this year and probably part of next.

JIM: **That's just it. Harry'll pay you $75 to repair his worn out equipment and next year, when it fails again he'll say, "Why, I just paid Bill $75 for repairin' this, and now it's gone again." *Do you think that Harry is goin' to call you back to repair the job? No—he's goin' to call someone else,* and they're goin' to do exactly what you ought to do in this case.**

BILL: What's that?

JIM: **You can go down to Harry's, take this circular on compressors and this catalog on coils. Show him how much more efficient these compressors are, than the one he bought ten years ago. Show him this new efficient coil that'll give him twice the results of his old brine system. *If I remember right Harry's got an old case over there that he's usin' ice in, right now, because he don't have enough compressor capacity.* This size compressor will be able to take care of both cases, you'll eliminate the messy ice condition in the one case, and you'll have better performance from the coils than the old brine system.**



Harry'll be much happier and he'll be able to present a nicer appearing meat counter to his customers with the new equipment. He'll also have a compressor and coil that will last him another ten years without any extra expense. *His customers, you can bet, will notice the change—and Harry, proud of his new installation, will tell 'em you—Bill Brown—did the work.* Right away, Harry, without knowin' it, is actin' as a salesman for you on other jobs. See what I mean?

BILL: Say, Jim, it sounds like you've got somethin' there, but I don't know an awful lot about sellin' this new equipment.

JIM: **You know refrigeration—here are your catalogs, you know the size coils and compressors he needs, and you've got the prices on them. Harry**

is definitely a prospect for new equipment. *You can easily sell him on how this extra money for new equipment will be well spent. It'll probably take you an hour to sell him, and at the most a day to install the job.*

Now then, let's add up the points on both sides.

You say it'll take you two days to repair the system, you'll make $50, and you say that the installation will not last over two years at the most, with a very good chance of having a dissatisfied customer in case it don't hold up even that long.

Now, on the other side, you'll spend an hour selling him this equipment, and a day on the installation. You'll make yourself $150 or better for the day's work, you'll definitely have a satisfied customer who'll sell your services to other people, for no other reason than that he's happy about the job you did for him.

Already you've made three times the money in half the time. How does that add up?

BILL: Boy, have I been asleep at the switch! Here I've been, just sellin' my hands at $2 an hour, when I could've been out sellin' my brains for five times that much, with a lot less effort. *Give me those catalogs and watch my smoke! I'll be back in a couple of hours with some real money.* Thanks, Jim. You've shown me how I can really make my jobs pay off from now on.

600 ATTEND BINDER PARTY

Six hundred customers of T. W. Binder Co., Newark, N. J. jobber, attended the party recently given by that company in the Continental auditorium. Prizes, a refrigeration quiz, entertainment, and refreshments featured the affair.

DALLAS JOBBER ENTERTAINS

Annual stag party held recently by Electromotive Corp., Dallas jobber, drew an attendance of 168, far more than expected. In addition to entertainment and refreshments, Maj. W. H. Jack spoke on his war experiences, and E. P. Spore, Dayton Mfg. Co., discussed V-belts.

A TECHNIQUE WHICH REMOVES BOTH THE CAUSE AND THE EFFECT IS EXCELLENT, *BUT* . . .

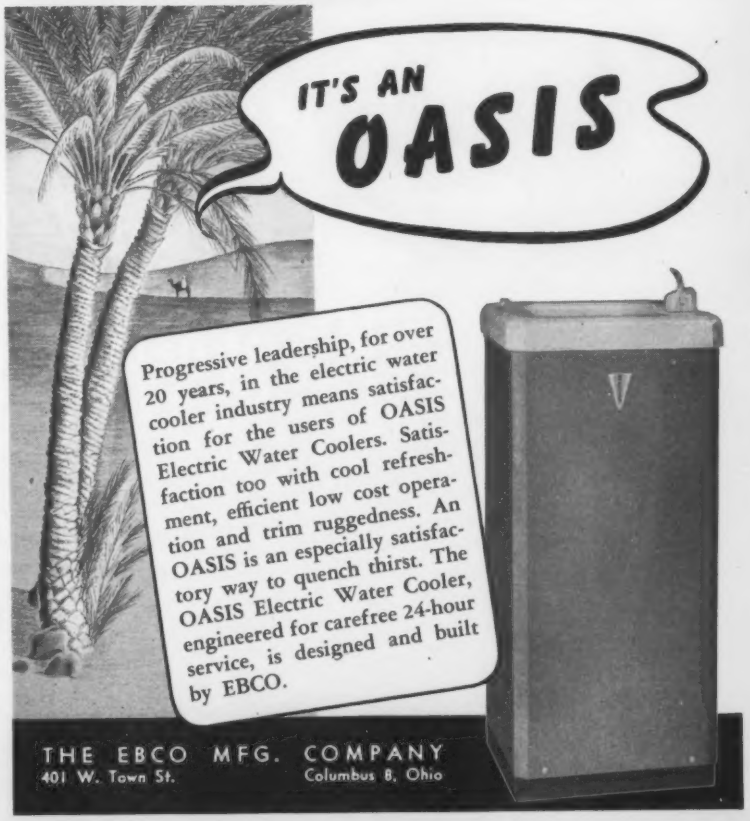
. . . one that *excludes* the cause . . . *prevents* it from getting in at all . . . is even *better*. The use of TZ in refrigeration units for the elimination of freeze-ups at the expansion valve, as well as the destruction of moisture and acid by chemical processes, is the Thawzone curative technique . . . the removal of both the cause and the effect. It's excellent and necessary for systems *already ailing*.

But, better still, is TZ inoculation of old, new, and reconditioned systems. To *exclude* the cause *before* trouble starts. That's *preventive* technique.

Refrigeration supply jobbers everywhere carry TZ.

THAWZONE
Fully Recognized by U. S. Patents
The PIONEER FLUID DEHYDRANT

HIGHSIDE CHEMICALS CO.
195 Verona Ave.,
NEWARK 4, N. J.



VISOLEAK

is a finely-treated colored refrigerant oil which penetrates every nook and cranny of the system. The leak is indicated by a red stain – just like the discoloration on a carburetor in which ethyl gasoline has been used. Can be used *safely* and *effectively* with any type of refrigerant.

See your jobber today. If he has not stocked Visoleak write for complete information.

WHOLESALE PRICES		CASE LOTS
4 ounce bottle	$ 1.00	48 bottles
8 ounce bottle	1.75	24 bottles
1 pint bottle	3.00	24 bottles
1 quart bottle	5.00	12 bottles
1 gallon can	16.00	6 cans

SAVE 10% ON CASE LOTS

WESTERN THERMAL EQUIPMENT CO.
5141 ANGELES VISTA BLVD.
LOS ANGELES 43, CALIF.

COLDSPOT . . .
Continued from page 27

used for a rough vacuum, and a rotary pump for a finish. At least 29″ of vacuum should be obtained and held for at least a half-hour. During this time, run the machine for three to five minutes to aid the evacuation. When this is done, charge the machine with two pounds of SO_2.

On most Coldspot machines, setting the expansion valve at 6″ vacuum will produce very good results. If a test box is available, set the control at 5 and check the machine so that it shuts off just as the frost line appears at the top of the base. Allow the unit to cycle for at least three days. At that time, allow the unit to defrost completely. Check with an ammonia swab for leaks. If none are found, the unit is ready for cleaning and refinishing.

Clean the bottom of the unit and the evaporator with a suitable cleanser. Do not use kerosene or any other oil base solvent as they will leave an odor in the customer's box. The top of the unit should be cleaned off thoroughly and sprayed with black lacquer.

Before delivery, be sure to screw the shipping bolts in securely, and remove when unit is installed.

Chief Service Problems

Now for service troubles:

If the overload kicks out on the control, several things may be at fault. Improper air circulation will overheat the system, raise the head pressure and increase the load on the motor. Check cabinet position for proper air flow. Dirt and lint also collect in center pass of condenser. The outside of the condenser may look clean, yet fail to pass enough air. A good trick to use here is to warm up your methyl cylinder and blow out the condenser with this pressure. Be sure to warn the customer of the resulting dirt before you start!

Bad bearings, defective motor switch, bad capacitor will also cause the overload to kick out. If the trouble is in the motor, remove and take to your shop for repairs, or to a motor repair organization.

If the seal or suction line leaks, the system may take in air and the head pressure will rise, overloading the motor. In such a case, the entire unit must be replaced. For temporary repairs, it may be purged.

If the compressor is stuck, the overload will also kick out. This is usually due to the unraveling of the intake screen and also necessitates removal of the entire unit.

For intermittent overload, check the time of the trouble; if at night, the trouble may be due to low voltage. The power company will usually take care of this unless the customer's wiring is defective.

Water in Valve Bellows

Water may accumulate in the bellows of the expansion valve and cause erratic operation. This can usually be remedied by removing the breather cap and heating the bellows cap with a Prestolite torch to drive out the moisture, being careful not to overheat. If the breather cap fits loosely, or is punctured, replace with a new one.

Gas or oil should not be added in the customer's home. If either have to be added, the unit *must have a leak.* In this case, remove the unit to your shop for repairs. You will be doing both yourself and your customer a favor in not patching it up by such a procedure.

PERFEX CORP. WORKERS WILL SHARE IN PROFITS

Directors of Perfex Corp., Milwaukee, have approved a profit-sharing plan designed to provide employes with retirement benefits at the age of 65. These benefits are in addition to those provided by the Social Security program.

Employes need not contribute, and share in the plan according to a scale based on earnings and number of years service with the company. Persons leaving the company prior to retirement will share in the plan, which also provides total disability and death benefits for each participant.

FOURTH "E" FOR MIDWEST

Midwest Mfg. Co. announces that the War Department has advised them of their fourth Army-Navy "E" award. The Galesburg (Ill.) firm, prewar manufacturers of refrigerator cabinets and kitchen cabinets, has made a wide variety of war products for the army, navy and air forces.

CHECK DOOR GASKETS ON EVERY JOB

JARROW PRODUCTS
420 N. LA SALLE ST., CHICAGO 10, ILLINOIS

PETE *and* PAT . . . *The PENN-TUBE Pals*

"Hey, hey! Cut that stuff—Penn Tubing performs O.K. *without* that monkey business!"

REMEMBER! It's PENN TUBING for PERFECT PERFORMANCE

Of course, PENN TUBING performs O.K. It's easy bending, it's clean and bright, it's made in all sizes from 1/8" to 3/4" inclusive—25-, 50- and 100-ft. coils. Your jobber is waiting to supply your needs!

PENN BRASS & COPPER CO.
Phone 35-111 ERIE · PENNSYLVANIA
Manufacturers "SUPERIOR" BRAND SEAMLESS REFRIGERATION Tubing
1920 · 1945 ★ OUR 25TH ANNIVERSARY

BRING THESE BENEFITS...

Increased sales, bigger profits, customer satisfaction and good-will, repeat business.

TEXACO CAPELLA OILS meet the lubrication requirements set by leading air conditioning and refrigerating equipment manufacturers, all of whom use, recommend or approve them.

Texaco Capella Oils come in six different viscosities, all with exceptionally low pour points. They are dehydrated, highly stable, and do not react with refrigerants. They are strongly resistant to breakdown, gumming and sludging.

Careful selection of crudes and superior refining methods make *Texaco Capella Oils* truly outstanding. You can now get them again in attractive *re-sealable* containers — 1-qt., 1-gal., and 5-gal. cans.

The handy Texaco Lubrication Guide lists make and type of compressor and refrigerant used in each of 55 makes of electric refrigeration units and 32 air conditioning units, and shows at a glance which oil to use for each. A valuable aid in servicing. Copies free upon request.

Get set with this combination for profitable summer business. Order *Capella Oils* now for prompt delivery. Get in touch with the nearest of more than 2300 Texaco distributing plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO Capella Oils

FOR ALL AIR CONDITIONING AND REFRIGERATION EQUIPMENT

TUNE IN THE TEXACO STAR THEATRE WITH JAMES MELTON EVERY SUNDAY NIGHT — CBS

EUROPEAN MARKETS AS SEEN THROUGH G. I. EYES

Some interesting comments on the use of refrigeration equipment in Europe, as seen through the eyes of an ex-refrigeration man now in uniform, have been received by Jim Downs, of Refrigeration Supplies, Cleveland, from Sgt. Earl T. Evans, of the 37th Traffic Regulation Group.

Writes Sgt. Evans:

. . . Refrigeration does seem rather remote, and yet you would be surprised at how many wrecked butcher shops, "bistros," and theaters I have inspected for evidences of refrigeration.

In the larger towns I have seen evidence of some beer cooling with coil boxes. Butcher shops that have any (refrigeration) at all usually amounted to a chest for keeping, I presume, the more perishable items. Theaters, I found, had a very elementary ventilation system only. In Belgium there were a lot of household boxes in the barrooms—a lot of American makes disguised under another name.

All in all, I would say Belgium and Luxembourg would make good markets for all phases, and perhaps, parts of France—Paris, Nancy, and the southern metropolitan areas. Other areas have done without such things for ages, literally, and as far as I can determine, intend to do without for time to come. . . .

I found a fairly modern butcher shop (what was left after artillery had blasted the place) a machine that looked to be about ⅛ h.p., air, with a blower coil in a tile-lined reach-in box. The machine was a "LeBrun"—it sounds familiar, but I'm not sure it is American. American fittings and tubing, Detroit Lubricator pressure control and expansion valve. The coil had no label. The V-belt was of European make—not rubber, but some other composition. . . .

FELIX WIERMAN HEADS MILWAUKEE R.S.E.S.

Felix R. Wierman of Perfex Corp. has been elected president of the recently reorganized Milwaukee chapter of Refrigeration Service Engineers Society. Other officers elected are:

G. D. Wang, first vice president; Herbert Beck, second vice president; George Shirmacher, secretary; Walter Stelma, treasurer; Leo Slawner, sgt.-at-arms.

M-H EARNINGS

Minneapolis-Honeywell Regulator Co. reported for the three months ended March 31, 1945 after reserves for taxes, and other provisions, net income of $886,696 including estimated post-war refund of $240,900.

THE PRACTICAL MANUAL . . . by Harold Smith

VIII. Milk Processing (Cont.)

The temperature of the milk will rise during the bottling operation and due to the 80° temperature of the bottles. Consequently, the refrigeration load for the cooler is the heat leak through the insulation, the service load, and the product load. The heat leak and service loads are figured in the usual manner. The product load is the number of quarts or gallons of milk the K factor x the temperature difference, between entering and leaving the cooler (temperature pull down).

This figure is divided by the number of hours the milk remains in the cooler. In most operations, the milk is bottled and placed in the cooler by 10 or 11 a.m. and held until 4 or 5 o'clock the next morning, when it is loaded on the trucks for delivery, usually around 18 hours. The figure is the B.T.U.'s per hour for the milk.

CRATES AND BOTTLES

The same procedure is used to establish the refrigeration load per hour for the bottles and crates. The product load on bottles and crates is based on the quarts or gallons of milk x the K factor x the temperature pull-down, divided by the length of time stored in the cooler.

Note: The K factor for bottles and crates is set up on the basis of pounds, quarts or gallons of milk to simplify the procedure, therefore do not confuse this by using in your figuring the number of bottles or crates, as this would throw your figures off. Table II is an example of a products load of 100 gallons of milk per day.

This same problem can, of course, be worked out on the basis of pounds or quarts by using the K factors that apply. The temperature in the cooler should be maintained at from 35 to 38° F. for a satisfactory condition. However, if a lower products temperature is required, it may be necessary to lower the cooler temperature to 25 or 30°.

FORCED CIRCULATION

By keeping the cooler at 35 to 38° a defrosting cycle can be maintained, and the evaporator would not require defrosting. The forced-draft type unit cooler is very satisfactory in milk cooling applications. The forced circulation gets in and around the crates and picks up the heat from the products quickly. Humidity within the cooler is no particular problem, as the milk is always covered when in storage.

When temperatures below 35° are required in the cooler, finned-type gravity convection coils, pipe coils, plates or brine tanks can be used as evaporators.

TABLE II—PRODUCT LOAD DATA

Temp. of milk going into cooler 60°F. out 40°F. = 20° pull-down
Temp. of bottles going into cooler 80°F. out 40°F. = 40° pull-down
Temp. of wood crates going into cooler 80°F. out 40°F. = 40° pull-down

Milk —100 x 7.74 x 20 ÷ 18 = 860 B.t.u.'s per hour.
Bottles—100 x 1.12 x 40 ÷ 18 = 249 B.t.u.'s per hour.
Crates —100 x 2.30 x 40 ÷ 18 = 511 B.t.u.'s per hour.
Total products load .....1620 B.t.u.'s per hour.

G-E SETS UP SEPARATE AIR CONDITIONING DEPT.

Establishment of the air conditioning department as one of the six major operating departments of the General Electric Co. was announced recently. Operations pertaining to heating, air conditioning and commercial refrigeration have previously been the responsibility of the company's appliance and merchandise department. The new department will have its headquarters at Bloomfield, N. J., and George R. Prout has been named general manager.

BASTIAN-BLESSING WINS "E"

The War Department for the fourth time has conferred its "E" award upon Bastian-Blessing Co., Chicago. The company is building soda fountains and ice cream equipment for installation on U.S. Naval vessels, and equipment and parts used in warplanes, submarines and other armament and ammunition.

Several years ago, brine tanks were very popular and were used frequently in milk cooling. The brine tank, installed in the cooler, not only served as the evaporator for the cooler but the brine was also used to cool the milk passing over the aerator, the cold brine being circulated by a pump from the brine tank to the aerator. There are a number of objectionable features to the use of brine tanks, and today they are not used extensively, particularly within the cooler.

AERATOR COOLING

Where brine tanks are used with aerators they are heavily insulated and set outside the cooler and used only with the aerator as a rule, although cold brine can be piped to an evaporator in the cooler and used to provide refrigeration in the cooler.

The principal objections to the use of brine tanks are that they are large and take up a lot of valuable space in the cooler or in the processing plant. They represent a high initial cost and depreciate rapidly, due to the corrosive action of the brine.

The brine pump adds further to the initial cost and is also frequently the cause of considerable service expense. The lines carrying the brine must be insulated, and when the tank is located outside the cooler it also must be heavily insulated.

BRINE TANK USE

Advantages of the brine tank are that it can take care of both the cooler and the aerator, thus eliminating the cost of a separate evaporator when installed in the cooler. It also can recover its cooling capacity during the off periods, consequently enabling the job to be handled with somewhat smaller condensing units.

Our first example was an installation using a milk cooler to produce the initial pull-down of the milk temperature and to remove animal heat and odor. We will now consider the initial cooling using an aerator for this purpose.

When an aerator is used, the processor should have a good volume of well water that can be depended upon at all periods of the year. The top section of the aerator usually uses well water for the initial heat transfer. Brine can be used throughout the entire aerator, but such use builds up the heat transfer load to such an extent that the size of the brine tank has to be increased considerably, and the increased refrigeration load requires the use of much larger condensing units.

Well water in the country is usually available at temperatures of 50° or lower. With a good volume of 50° water passing through the upper section of the aerator, the milk at a temperature of 98° will be cooled while passing over this section of the aerator to within 10 to 15° of the temperature of the water; or to from 60 to 65°.

BRINE TEMPERATURE

At this temperature, the milk flows over the sections of the aerator using the brine as a heat transfer medium. The brine cools the milk from, say, 65° to 40° while it passes over the brine section, a pull-down of 25°. The milk, cooled from 98° to 40° in passing over the aerator, is ready for bottling; which, of course, follows the same procedure as outlined earlier.

Usually brine temperatures of 20° are used for aerator cooling. This gives a temperature difference of 20° in the heat transfer across the aerator (40° milk, 20° brine). When brine is used for cooling, it is a standard practice to use a 2½-to-1 ratio; that is, 2½ gallons of brine for each gallon of milk to be cooled.

(Direct expansion aerator cooling will be discussed in the third article on milk processing, to appear next month.)

Electrimatic
Regulating Valves

•

Automatic control and regulating valves for Freon, Methyl Chloride and Ammonia. A large variety of sizes and types available for practically any refrigeration requirement.

WL water regulating valves for Freon, Methyl, or Sulphur. ⅝" orifice and ⅜" FPT. Brass body construction. Large capacity—no chatter.

WP water regulating valves are available in ⅜", ½" and ¾" FPT sizes. Brass body construction for Freon, Methyl or Sulphur. Easy adjustment.

WK water regulating valves are De Luxe Pilot Operated Modulating valves. Iron body, simple adjustment. Available in sizes ranging from ¾" to 2" FPT.

WR regulating valves for Ammonia are diaphragm operated and highest quality corrosion resistant materials are used. Available in sizes ranging from ⅜" to 2" FPT.

Electrimatic valves are individually tested for efficient, economical operation. Trouble free performance.

•

Ask for a copy of our latest catalog today.

Electrimatic

2100 INDIANA AVENUE

CHICAGO 16, ILL.

FRIGID TUNNELS STORE FOOD IN FRANCE

The 4163rd Quartermaster Refrigeration Company believes it operates the Army's most unusual cold storage plant. It uses three vast tunnels, 50 feet underground and opening on the face of a Normandy coastal cliff, for storing as much as 3,000 tons of fresh meat at a time.

The caves were excavated by the French about 1928 for use as ammunition dumps. Following the Normany landing, engineers installed a system of overhead ammonia pipes and a Freon cold-blowing apparatus which maintains a constant temperature of about 14° F.

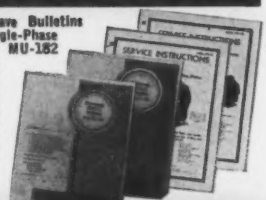
Each tunnel is about 250 feet long and 30 feet high with four sizeable lateral bays leading off on either side of each passage. Operating on a round-the-clock schedule, the Quartermasters receive the meat by truck directly from refrigerated vessels, stack it in the bays, and re-issue it to the big refrigerated vans for the journey to the front.

If your AIR-CONDITIONING OR REFRIGERATION EQUIPMENT *has gone to War...*

If the equipment you are now manufacturing is essential to war production plants, housing projects, or to the armed forces, Wagner will gladly figure with you on your motor requirements. Consult the nearest of Wagner's 29 branches, located in principal cities and manned by trained field engineers.

Write For Bulletins

You should have Bulletins MU-183 (Single-Phase Motors) and MU-182 (Polyphase Motors). Besides these two bulletins you should have Service Bulletins MU-7, MU-26, MU-30.



M44-21

Wagner Electric Corporation
6642 Plymouth Avenue, St. Louis 14, Mo., U. S. A.
ELECTRICAL AND AUTOMOTIVE PRODUCTS

NEW MEXICO JOBBER CHANGES NAME

Radio & Refrigeration Parts Co., supplies jobber in Albuquerque, N. M., has changed its name to J. Miller Supply Co., and has moved to a new location, 1121 South Walter St.

REFRIGERATOR ON WHEELS

First of its kind to go into serice, a new Fruehauf refrigerator van, equipped with built-in "Trail-aire Conditioner," is used by Deitch of Detroit, distributors of Honor Frozen Foods, for overnight shipments from Detroit to warehouses in Chicago, Cincinnati, Indianapolis and St. Louis. The compact Fruehauf Trail-aire unit in the nose of the trailer maintains a constant temperature with an air circulation of 1500 c.f.m., and can be used to supply either heating or cooling, as needed.

NEW WEBER PLANT

Production of sectional refrigerators for military use is under way in a new plant recently opened by Weber Showcase & Fixture Co. in El Paso, Texas. Three sizes of units are being made: 620, 1800, and 3290 cu. ft.

SPRAGUE *Universal* MOTOR-STARTING CAPACITORS

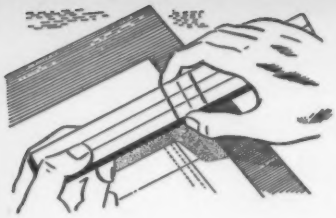
Write for Sprague Booklet C-352 "A New Complete Story on Motor-Starting Capacitors." Get the facts about the small, Sprague Series 3500 *Universal* Motor-Starting Capacitors which enable you to make almost any replacement from a very small stock. They fit anywhere—are more dependable than the big old-style units they replace — are available for immediate shipment from 24 mfd. to 350 mfd., 110 V. A-C.

SPRAGUE PRODUCTS CO., North Adams, Mass.

Jobbing distributing organization for products manufactured by The Sprague Electric Co.

Prompt deliveries!

***This ONE* SMALL UNIT REPLACES ALL OF THESE!**



Shop Desk

A sturdy portable desk especially adaptable for shop foremen, shipping clerks, inspectors, dispatchers and others, is being marketed by Lyon Metal Products, Inc., Aurora, Ill.

Portable model No. 2131-15, priced at $26.45, stands on 3" swivel casters

and has a positive brake attachment. Overall size of the unit is 34½" wide, 30" deep and 53" high (43" high in front).

Desk hood provides adequate space for the storage of working papers and has a smooth 30" desk top with a 3" overall slope. Spacious drawer, 24"x 28"x3½" in size, is equipped with a lock for the safekeeping of important papers.

Air Motor

A new, more powerful "big brother" to the Bellows BM5 air motor is being introduced by The Bellows Co., Akron, Ohio. The new motor, the BM10, develops more than twice the piston thrust force of the standard BM5 motor on a given air line pressure.

The air motors operate on any air line pressure up to 175 lbs. They differ from conventional air cylinder design in that the valve and all operating controls are integral with the cylinder, permitting full and positive control over all operating phases at all times. Only one air connection is required, which may be either with flexible air hose or rigid piping.

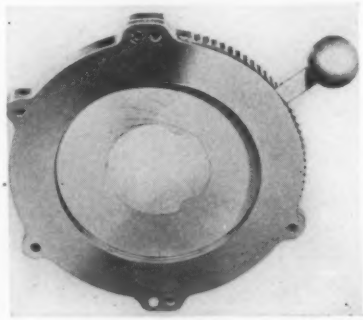
Infrared Lamps

Seven new infrared lamps, including four clear drying and three reflector drying types, with wattages ranging from 125 to 500, have been announced by Sylvania Electric Products Inc. for use in plastic and metal preheating, baking, drying, and dehydrating. The reflector drying types offer an inexpensive and flexible infrared heating source for many drying and processing applications, including those in paint shops.

Ventilator Control

A new patented heat and ventilator control unit known as the aero valve is announced by Smith-Mautz Co., aircraft parts and accessories manufacturer, Glendale, Calif.

The unit originally was developed for the aircraft industry, but is ap-



plicable to any air or heat control application, particularly in the marine, air conditioning, or bus transportation field.

The unit has 36 positive control stages, and is designed like a camera shutter, with 15 to 18 shutter segments. Aluminum die cast cover and housing have anodized finish; all other parts are made of stainless steel. Knob on control lever is an AN standard part.

The valve is said to operate without efficiency loss at temperatures varying from 65° below zero to 400° above. Available in five model sizes with openings from two to seven inches in diameter.

Spot Welding Tweezers

A handy new device adaptable for use by refrigeration shops in welding small parts is the new Besco spot welding tweezers developed by New Jersey Jewelers' Supply, Newark. The tweezers hook on to present spot welding equipment.

The accessory consists of a pair of

insulated, forged copper tweezers with plastic covered, flexible copper leads terminating in a pair of lugs which connect in place of regular welding electrodes. The tweezers will unite copper parts, nickel, steel, tin, tin alloys, brass, monel, zinc, bronze, nickel to tungsten and copper to nickel.

They operate from ½ to 1 KVA on 10 amp. current and are used with a timer which cuts the current and times the length of the weld.

Compressor Seal

A new type of compressor shaft seal incorporating an "elastic sleeve" principle has recently been introduced by Temperature Control Devices, New Haven, Conn.

The elastic material, which is oil resistant, is said to assure greater resilient action without use of springs, shims, or shaft glands, and to eliminate need for special end plates when used as a replacement seal. It is said to work equally well on worn, pitted, bent or slotted shafts.

Reach-In Refrigerators

A line of "Rogers" reach-in refrigerators ranging in size from 17 to 72 cu. ft. has been marketed by Modern Appliance Co., San Mateo, Calif.

Four models are available in the all-porcelain line, and seven, including two dough retarder units, in the

baked enamel finished series. All except the largest models have self-contained condensing units.

Features of the all-porcelain series include up-draft blower type coils which are said to produce temperatures of 36-38° with 85-90% relative humidity. Baked enamel series, a general utility line, uses an overhead blower type coil said to assure positive air circulation and prevent drying of foods. Dough retarder units are available in four and six-door models.

Food Storage Locker

Production of a new "Broadview" frozen food storage locker has been started by Safe-Way Food Locker Co., Chicago. The new model differs from conventional units in that locker drawers are shallower and wider, allowing seven lockers per tier instead of the usual five.

Width of a tier is 35" overall, compared with the usual 18 to 20"; lockers are 24" long, and a seven-locker tier is 93" high. Top two lockers have hinged doors, the lower five are drawer type. The additional drawers make possible 50% more rentals in the same space now occupied by conventional units, the company says.

Splined Rivnut

A new Rivnut of the splined type suitable for use in wood, plastics, leather, hard rubber or other material where it is necessary to firmly anchor a nut for attaching accessories is announced by B. F. Goodrich Co. This type is in addition to the regular line of Rivnuts being adapted for use in many fields, including aircraft, automotive, refrigeration and electrical equipment. The Rivnut was originally developed by the company for use in the aviation industry.

Propeller Type Fans

The Trance Co., La Crosse, Wis., has enlarged its line of propeller type fans to include new models and a greater variety of sizes. Fans may now be obtained with either 2 or 4 blade propellers with direct or belt drive. The two blade fans are available in sizes ranging from 15" to 48" in diameter. Four blade fans start with a 10" diameter and extend thru 72". Both belt and direct drive fans may be obtained with the motor outside the air stream.

"CLEAN-A-COIL"

FOR
DE-SCALING
CLEANING

WATER COOLED CONDENSERS, COOLING COILS, EVAPORATORS.

NOT CLASSIFIED AS CORROSIVE LIQUID

Write for Descriptive Literature or Consult Your Local Jobber

Standard Solvent Co.

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CHICAGO 15

TEMPRITE

Equalizer Tanks

Reduce wear on:

1. Condensing unit motors
2. Condensing unit belts
3. Condensing unit control points

and

4. Reduce consumption of electric current

Now, more than ever before, TEMPRITE Equalizer Tanks are important in prolonging the life of condensing units. Users have found that an Equalizer Tank will overcome the short cycling condition caused when the load applied to a cooler or lowside is intermittent and of short duration. The elimination of condensing unit short cycling reduces excessive wear on the motor, belt, and control points and lowers the consumption of electric current.

To overcome this short cycling the TEMPRITE Equalizer Tank acts as a suction gas storage tank between the lowside and the compressor.

These TEMPRITE tanks can be installed on all types of refrigeration equipment. They are made of cold rolled steel, are electrically welded, pickled and neutralized, insuring them of being free from scale and rust; they are then dehydrated and thoroughly tested for leaks.

TEMPRITE Equalizer Tanks carry Underwriters Laboratories, Inc., approval. Protected by U. S. Letters Patent.

5 sizes available

¼ H.P. up to 15 H.P. Condensing Units

LOOK *10 Day Delivery!*

★ **Dealers:** Here is good news for you—TEMPRITE Equalizer Tanks can be delivered within 10 days after we receive your order with the proper priority extended to us. For complete information write our sales department today. ★

TEMPRITE PRODUCTS CORP.

Originators of Instantaneous Liquid Cooling Devices

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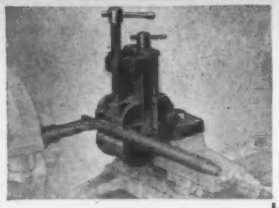
ANGLE VISES *for* REFRIGERATION REPAIRS

Refrigeration Repair Shops and Jobbers are finding these two products indispensable in service, profits, success. Difficult angle jobs solved. Quick, accurate set-ups for hand or machine Drilling, Grinding, Filing, Fitting and 101 other important shop operations. PALMGREN ANGLE VISES are made with 1½"—2½"—4"—6" and 8" jaws. Accurately machined and graduated. Hardened steel jaws, plain or grooved.



No. 000 on SWIVEL BASE

Milling Fixture Vise For Lathe Increases Volume

Save time, do milling jobs on lathe. Fits 8"—9"—10" South Bend, Atlas, Craftsman, Sheldon, etc. Graduated vertical feed screw and 360° graduation for vertical angle adjustments. Mounts on cross slide and held by T-Slot bolt. Vise has 2½" jaws, 1-7/16" deep, grooved and plain. Price $24.75.

Write for Circular No. 348 and Jobber Helps

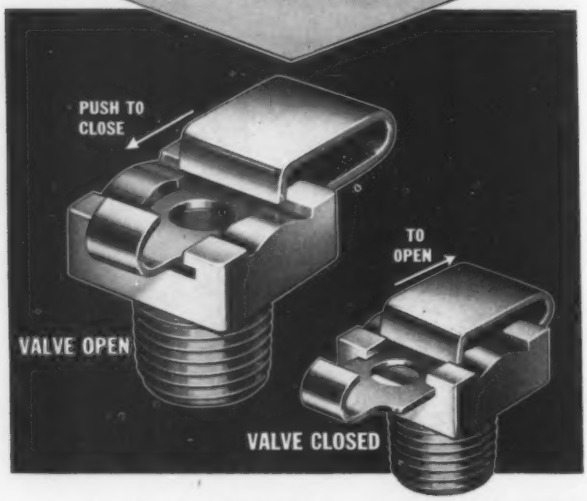
CHICAGO TOOL AND ENGINEERING CO.

Mfrs. of PALMGREN PRODUCTS for over 25 years.

8410 South Chicago Ave. Chicago 17, Ill.

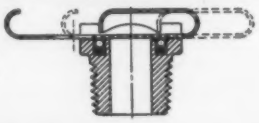
CAN YOU USE A NEW DRAIN COCK

. . . that will operate under pressures up to 200 lbs. per sq. in.? . . . that can be used with all types of liquids?



The construction of this new drain cock is so simple that the possibility of functional failure is reduced to a minimum.

It has but four working parts and is sealed with a standard "O" type ring that can be easily replaced. Lightweight, yet rugged in construction, it is vibration proof and positively will not leak. Its simplicity of design and minimum of working parts make this drain cock a must in all postwar water, oil and gas systems. For full information write the Engineering Department and indicate use or application desired.



Whittaker

WM. R. WHITTAKER CO., LTD., 915 NORTH CITRUS AVENUE
LOS ANGELES 38, CALIFORNIA

WHAT'S YOUR SCORE?

CONTINUING our "brain-buster" quiz begun recently, here are five more questions to test your know-how as far as refrigeration is concerned. If you really know your business, you should be able to answer all of them. Anyhow, score yourself 20 for each one you answer correctly. Answers are printed upside down below.

1. What is the function of mechanical refrigeration?
2. Why is insulation necessary in a refrigerator?
3. What is the function of a condenser?
4. What is the function of a liquid control valve?
5. What is the function of a temperature control?

ANSWERS: 1. To move heat units. 2. To retard flow of heat into the refrigerated area. 3. To remove heat from superheated refrigerant vapor under pressure so that it can reduce its temperature and pressure and condense. 4. To maintain an adequate supply of refrigerant at the lowside. 5. To stop equipment when design temperatures are satisfied, or start it when additional cooling is required.

AEROVOX CORP. SOLD

A group headed by W. Myron Owen, formerly vice president of Detroit Harvester Co., and including H. Bruce Kinsman Associates of New York, has purchased the Aerovox Corp. New Bedford, Mass.

KEROTEST GETS 5th STAR

Kerotest Mfg. Co. has received a fifth and final gold star for its Maritime "M" pennant in recognition of continuous outstanding production of essential valves and fittings for the U. S. Maritime Commission.

CORRECTION

In the third paragraph of the article headlined "Sunroc Seeks National Water Cooler Sales," appearing on page 48 of our May issue, the opening sentence reads: "These heavy-duty coolers, built to Government specifications, are duplicated for the *aviation* trade." The sentence should read "*civilian*", not "aviation". Sunroc does not make anything for the aviation trade.

Refrigeration Service Engineers

PERFORMING OUTSTANDING MAINTENANCE JOB

Today, in towns all over America refrigeration service engineers are doing an outstanding maintenance job of keeping refrigerated display cases, ice cream cabinets, food storage lockers and the countless other applications of refrigeration running smoothly and efficiently.

On call the refrigeration service engineer performs his task, oftimes while the city sleeps. Thousands of dollars he has saved retailers, countless thousands of pounds of precious food he has prevented from spoiling.

These men rely upon A-P DEPENDABLE Refrigeration Controls. They use A-P DEPENDABLE Refrigeration Controls to help them perform their important task. As many of them write "I use a lot of A-P Controls and never had one fail me yet."

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A-P Model 215 Thermostatic Expansion Valve. Capacity up to 6 tons Freon.

DEPENDABLE *Refrigerant Valves*

Stocked and Sold by Good Refrigeration Jobbers Everywhere • Recommended and Installed by Leading Refrigeration Service Engineers

IT'S UP TO YOU TO HELP MAKE 2=3 WITH...

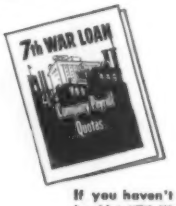
A job for seasoned executives—this 7th War Loan! Especially when we've got to make 2 war loans total just about as much as all 3 in 1944! Putting this over demands the combined and *continued* efforts of the "No. 1" men of American industry.

This means marshaling your plant drive to make every payday—from now 'til June 30th—do its share toward the success of the 7th. Directing the drive is not enough. It's equally important to check to see that your directions are being carried out—intelligently!

For example, has every employee had:

1. an opportunity to see the new Treasury film, "Mr and Mrs America"?
2. a copy of "How To Get There," the new Finance Division booklet?
3. a new bond-holding envelope with explanation of its convenience?
4. 7th War Loan posters prominently displayed in his or her department?
5. information on the department quota—and an urgent personal solicitation to do his or her share?

Remember, meeting—and beating—your highest-yet 7th War Loan quota is a task calling for "No. 1" executive ability. Your full cooperation is needed to make a fine showing in the 7th! Do not hesitate to ask your local War Finance Chairman for any desired aid. It will be gladly and promptly given.



If you haven't a copy of this important booklet, "7th War Loan Company Quotas," get in touch immediately with your local War Finance Chairman.

The Treasury Department acknowledges with appreciation the publication of this message by

THE REFRIGERATION INDUSTRY

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